SUPPLEMENT.

The Mining Journal,

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No. 2156.—VOL. XLVI. LONDON, SATURDAY, DECEMBER 16, 1876. PRICE (WITH THE JOURNAL) SIXPENCE. PER ANNUM, BY POST, £1 4s.

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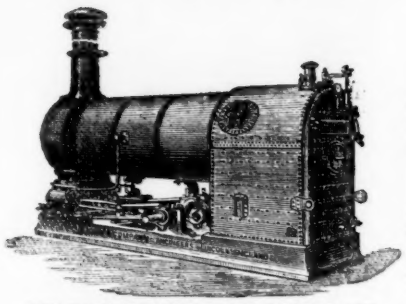

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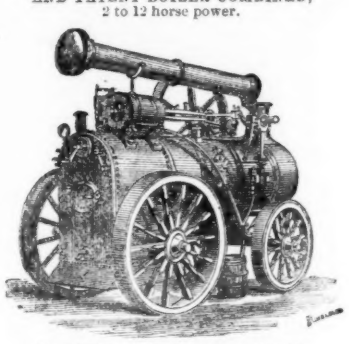

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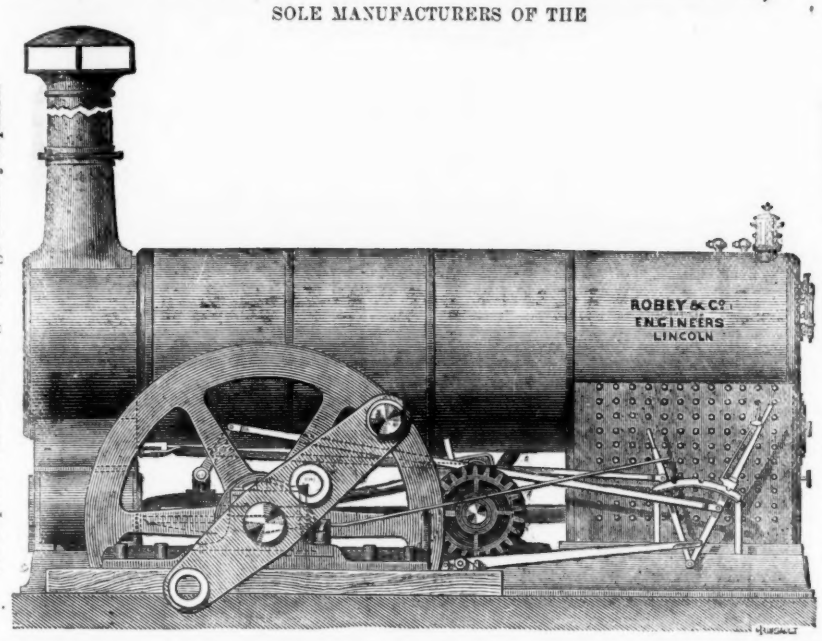

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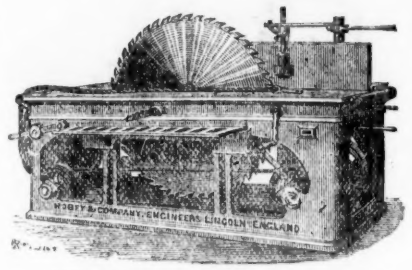

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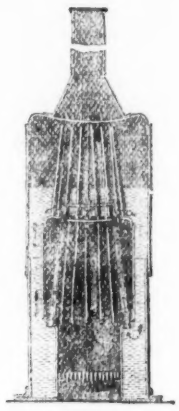

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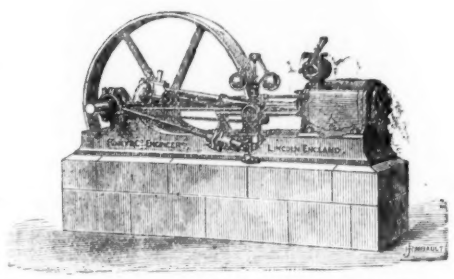

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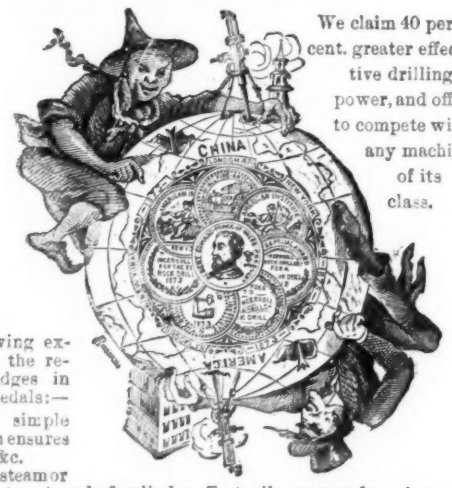

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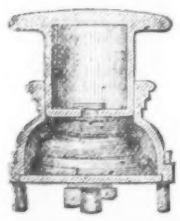

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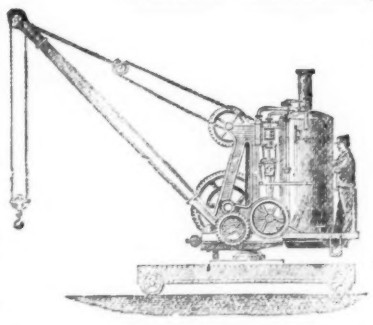

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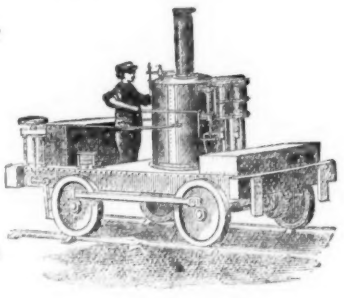

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Mr. TAIT, Manager, East Hetton Quarry Company's Works, Coxhoe, Durham, writing on May 12, 1876, says—"I have pleasure in testifying to the value of your Rock Drills. The two you supplied us with about six months ago are giving us entire satisfaction. The cost of drilling by machine is less THAN ONE-FOURTH THAT OF DRILLING BY HAND. By the use of the Drills we have been able very greatly to increase the out-put of stone without increasing the number of men employed."

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Original Correspondence.

IRON MINING, MAKING, AND COMMERCE.

The present posture of iron mining and making is, on the whole, unsatisfactory, for although in some places there is improvement, in others there is decline. In certain directions where reverses have been heavy there is revival, but in others depression becomes deeper. One great cause of this is that there is a strong disposition on the part of some ironmasters to raise prices upon any noticeable increase of demand, which immediately causes reaction, and orders are stopped. The home consumption of iron is at present better than the export trade, and this is to some considerable extent caused by the lower rates in Belgium, and by the Pennsylvanians and others in the United States increasing the iron output for themselves, smelting the ores thus obtained, and fabricating the iron with skill and enterprise. While comparative activity in the home trade does not affect exports, it is very much influenced favourably or unfavourably by the latter, so that it is opportune at suitable intervals to review the state of the export trade, for without doing so the probable progress of iron mining can hardly be conjectured.

The last Returns of the Board of Trade, or more strictly of the Custom House, have only been a few days out, and they reveal with tolerable approximation to accuracy the present condition of our commerce in iron. The value of imported iron for the 11 months of the present year are a little over 750,000*l.*, about 250,000*l.* more than in the corresponding period of 1875, which is, on the whole, a symptom of the revival of the manufacture, if not of the mining. Bar-iron was imported to a little more than 1,000,000*l.* in value, nearly 250,000*l.* less than last year, which certainly does not indicate that foreign competition is increasing, which negative advantage is confirmed by the fact that while the imports of iron manufactures which were imported to the value of 1,250,000*l.* (round numbers) this year were less in value by about 10,000*l.* than last year in the same space of time. What steel was received from abroad was unwrought, and of the value of 134,000*l.*, against 104,000*l.* last year, but this is explained by our increased export of foreign unwrought steel, and the enlarged demand for home consumption. The total value of iron and steel imported was 3,215,864*l.*, not materially different from that of the first 11 months of last year. Of our foreign importations no ore was exported, so that all we received was worked up in manufactures. The value of 409,601*l.* in foreign bars was sent away, against 451,567*l.* last year not a material difference, but 100,000*l.* more than in the previous year. No iron manufactures are recorded in the exports of foreign produce, because we imported none except for their artistic beauty, in which direction the Germans, French, and Belgians vie with us, and what may be called their fine art iron work is, to a considerable extent, admired here. Foreign unwrought steel was exported to the value of 48,000*l.*, a considerable increase upon previous years. Of our iron and steel imports we re-exported the worth of about 458,000*l.*

The exports of British iron and steel were of the total value of 19,288,204*l.*, a deplorable falling off from the eleven months of 1875, when the value was over 24 millions, and from 1874, when it was over 29 millions, thus justifying the lamentations which have sounded up to the metropolis from the iron mining and manufacturing districts. It is still, however, a great and noble industry, and, we trust, destined to rise again, and King Iron appear in his old glories.

The most valuable branch of the production for foreign customers is completely manufactured iron, "cast or wrought, and all other manufactures except ordnance not enumerated," but exclusive of rails, bars, plates, hoops, &c. The value of this class of iron production was 3,750,000*l.*, a falling off of only 250,000*l.* from the eleven months of last year, showing that the statements of Belgian competition, notwithstanding cheaper labour there, have been greatly exaggerated.

Rails and railway iron of all sorts was the next most important branch of export, being of the value of nearly 3½ millions, against 5¼ millions last year in the same space of time. The change from iron to steel rails on the Continent manufactured there will in great part account for this signal falling off. There is, however, reason to hope for improvement. Excitement exists throughout Australia for more railway accommodation, and Victoria alone is about to borrow 2,000,000*l.* for that purpose. The demand is for new railways equal to the whole of the existing lines. South Africa and Ceylon are stirring in the same direction, and the authorities of Japan, and even China, contemplate some enterprise of the kind. The demand for all these places will be made in the English market; it is, therefore, probable that the spring will open with good orders for the manufacturers of rails and railway iron of all sorts, and good news for our miners. Besides, the creation of railways creates a large consumption of copper, tin, lead, and zinc, spreading prosperity all over the mining interest. The Cleveland, Welsh, and Scotch makers are already on the alert, for all these have especially suffered. About 2½ millions have been lost in the last three years by the manufacturers of rails alone, where the depression has been most signal. Cleveland was the chief field of depression, but the masters have converted their rail-making works to mill and forge work so successfully as to sustain the iron trade of the district. The next branch of importance is that of tin-plates. The export value was 2,668,168*l.*, three-fourths of a million less than last year and the year before.

The foreign sale of pig-iron was 2,658,000*l.*, more than half-a-million less than last year in the same time. But more activity is observable in this department. Scotch pig-iron is in increased request for home consumption, and in Cleveland there has been a large increase in the manufacture and decrease of stocks, and the masters report that they have "full orders." Hoops, sheets, boiler and armour plates are classed under one head by the Custom House, and taken together they stand next in importance in the general classification. The export was 2,638,472*l.* during the last 11 months, a falling off as compared with those months in the previous year of 400,000*l.*, but about the same as in 1874. This trade has been sustained by the requirements of shipbuilding so far as armour-plates is concerned, and the demand for hoops and boiler-plates has been great throughout the year in London, Dublin, Bristol, and Scotland generally. The ironmasters in the North of England have lately been busy in this department of work for home, and to a less but encouraging extent for export, the returns for last month being larger than the corresponding month for several years.

Bar, angle, bolt, and rod (under one heading) figure for 1,797,219*l.*, nearly three-quarters of a million less than in the same time in 1875. Of late, however, there has been more activity in the North of England for angle manufacture, such as is used for shipping, and there is not at the moment discouragement amongst the makers. Unwrought steel figures for 825,144*l.*, against 987,000*l.* the same space last year. Manufacturers of steel, or steel and iron united, were answerable for over 700,000*l.*, not much different from the same period of 1875. But wire of iron or steel showed something of a falling off, the figures this year so far being 674,000*l.* The value of iron and steel sent abroad can hardly be estimated by a perusal of the Custom House details under the general heading, for much of both enter into various manufactures otherwise enumerated. Thus cutlery and hardware were represented together by 3,216,098*l.*, a decline of 700,000*l.* Machinery, millwork, and steam-engines amount to 1,817,000*l.*, another serious decline of 600,000*l.* Other descriptions, such as locomotives, tools, &c., 4,888,000*l.*; the decline in this department is most serious, amounting to 1,100,000*l.*, and the decline last month, as compared with the corresponding month of 1875 is at the rate of more than 2,000,000*l.* a year.

Still the importance of iron mining, making, and exports may be conceived from the fact, that including the above manufactures, ordnance and arms, shipping in which iron and steel constituted a large part, and small items not enumerated by the Board of Trade, the value of exports for the 11 months was probably 35,000,000*l.*, while the great woollen trade only exported to the value of 17,000,000*l.*; in fact, iron and steel exports in all forms exceeded those of any other branch of industry, cotton excepted, which stands for 50,000,000*l.* But if we take all departments of metals enumerated and unenumerated, and the articles into which they have entered, so far as that can be fairly estimated, it is evident that the products of our mines, manufactured and otherwise, leaving minerals out of the computation, will exceed in value the cotton or any other industry, that ever contributed to raise Britain to the wealth, grandeur, and power to which she has attained.

THE FLORA OF THE TROPICS, &c.

SIR,—Mr. Gardner has shown in his lecture at South Kensington, on Saturday, that fan palms, feather palms, and the ordinary products of the torrid zone once grew near Bournemouth, and in the forests of Hampshire. In the clays and sands of the early eocene period there are countless numbers of fossil leaves. We have also coal beds of immense extent over a great portion of this island, and coal beds are also found at intervals in most parts of the globe. Beds of great thickness are found near the North Pole. What I wish to ask the readers of the Journal who are geologists is this, do they hold that the climate met with in the torrid zone at present is capable of a vegetable growth sufficient to produce the necessary materials for the formation of coal beds, and if so, if coal beds are actually in course of formation there at present? If it is admitted that coal beds are in course of formation now, then we have only to suppose that a similar climate has existed in most parts of the world at certain intervals, but how can this be accounted for? Can the astronomers explain to us how the torrid zone has been shifted gradually from the poles to the equator?

Various conjectures have been made on the subject; the theory that this earth was originally—that is, the whole mass of it—launched into space in a high state of heat or a very high temperature appears to be the most feasible. The vegetable growth that produced the materials for the coal beds must have been prolific to a marvellous extent if we look at the masses of coal now found. At the point where we are writing shafts have been sunk so far through the coal measures, but the bottom of these shafts have not yet reached the bottom of the coal measures, and there are, doubtless, more seams of coal below; yet nine seams have been passed through, and some of them worked, the total thickness of these seams being 31 ft. 6 in. Underneath most of these seams a bed of fire-clay is found, varying in thickness from 1 ft. to 4 ft., and this clay is very rich in fossil remains. In one case, however, this fire-clay is found *above* the coal seam, and it is in this case extremely rich in fossils.

How the usual law has been reversed in this case it appears to be difficult to explain. The miners say that the seam has been placed upside down. If we are to account for the tremendous change of climate—first, the torrid zone, if that is capable of producing the necessary vegetable products; then the glacial period, &c.; by supposing certain changes to have occurred in the position of the earth on its axis, surely the question becomes a very complex one, but if it is admitted that the earth was originally in a molten state, and has been gradually cooling all through these ages, the solution of the difficulties of the case appear to be comparatively easy.

A. R.

ON THE ORIGIN OF METALS.

SIR,—Your correspondents Messrs. F. W. Mansell and Co. are doing excellent service to the cause of science by their able letters on the Mineral Districts of Nevada. The information they have already given relative to the Comstock Mines—information derived from careful enquiries on the spot—are invaluable, especially to those who are working in districts geologically and mineralogically identical with those mines. The discoverers of the ore bodies on the Great Comstock veins have set an example of patience, courage, and perseverance under difficulties worthy of all honour, and their reward, truly, has been great. The owners of the Consolidated Virginia and California Mines had faith in the truth I endeavoured in a recent letter to enforce—the igneous origin of mineral veins. They, doubtless, felt that as the minerals could originally only have come from below, so their great object should be to sink their shafts, with the conviction that their efforts would be crowned with success.

All successful mining must be based on the same principles—that mineral riches as a rule increase as depth is attained. It is quite true that ore deposits in many cases have given out at comparatively shallow depths, but over and over again miners have discovered that, after passing through a barren floor of silicious matter, a fresh deposit, richer than the surface one, has rewarded their energy and perseverance.

Messrs. F. W. Mansell and Co., in their letter in the Journal of the 9th inst., go into the question as to how the fissures, technically called veins, were filled, and they give their opinion that certain copper mines of Lake Superior and veins occurring in Little Cottonwood Canyon, Utah, containing copper, lead, and silver, are of undoubted igneous origin, stating that the trap dykes in their immediate vicinity contain those metals. So far Messrs. F. W. Mansell and Co. entirely confirm my own view. I cannot, however, agree with what follows—that "the silver mines in the immediate vicinity (I presume in Utah) are of undoubted aqueous origin, so are the gold and silver mines of Colorado, so are the mines of the other Western States and Territories." They give as the evidences of aqueous formation "the crystallisation structures of the gangue and metals, the vertical cleavage of the gangue, the presence of cavities filled with crystals, or with metallic or other crystals attached to the walls of such cavities, the crystalline structure of the ore itself, as in galena and other sulphurets."

Now, the best test I know is to give the analysis of two pieces of Comstock ore, which I am enabled to do, and then to see where the component parts must have come from. I bring this forward as a test case, as the Comstock is one of the districts included amongst those referred to by your correspondents. The following are the analyses:—

	No. 1.	No. 2.
Silica	83·95	91·49
Alumina	1·25	1·13
Protoxide of iron	1·95	·83
Protoxide of manganese	·64	—
Lime	·85	1·42
Magnesia	2·83	1·37
Potash and soda	1·28	1·05
Sulphide of zinc	1·75	·13
Sulphide of lead	·36	·02
Sulphide of silver	1·08	·12
Subsulphide of copper	·3	·41
Gold	·02	·0017
Bisulphide of iron	1·80	·92
Moisture	2·33	·59
Total	100·38	99·48

The question is—Could such ores as these possibly be formed by water, which is apparently what is meant by "aqueous origin?" In order to enable your readers to judge of this question I will give an analysis of a specimen of what is unquestionably a rock of igneous formation—porphyritic felstone—which is in my own possession, and it will be seen how very similar the chemical contents of the Comstock ores and of this felstone are. Of course the latter, being merely the "country" adjoining a silver-bearing lode, cannot be expected to contain much metallic mineral matter, but that does not affect my argument. The analysis is as follows:—Silica, 83·1; protoxide of iron, 4·1; alumina, 6; magnesia, 3·3; potash, 3; soda, ·5; lime, trace; silver, ·03: total, 100·03.

I do not doubt for a moment that hot mineral springs containing silica and the other component parts of the above specimens formed an important part in aiding in their formation. The silica would undoubtedly be in a liquid state in consequence of the presence of the alkaline elements, and probably this may have been the case with the other ingredients, the acids combining with the alkaline bases. What I wish to convey is my opinion that these mineral springs came from below, as also the porphyritic felstone, and that, probably, both are of volcanic origin. I do not believe that in reality there is much difference between the views of Messrs. F. W. Mansell and Co. and myself on the subject, and, as the discussion will probably be productive of good, I trust they will excuse my comments on their letter.

J. A. MORGAN, F.G.S.

Finsbury-circus, Dec. 14.

ROSSA GRANDE GOLD MINING COMPANY.

SIR,—Can any of your readers tell me what the shareholders of this company intend to do? There are rumours in the neighbourhood of Caiché, now that the scheme between Mr. Gordon and the directors for the issue of 10 per cent. debenture bonds has not succeeded, that private negociations are going on for the sale of Rossa Grande and Gongo Soco.—*Caiché, Oct.* 28. A SHAREHOLDER.

DON PEDRO NORTH DEL REY MINING COMPANY.

SIR,—I understand Mr. Gordon, of the St. John del Rey Mining Company, has paid a visit to Morro St. Anna—the mine of the Don Pedro Company; it will be most interesting to hear about what he saw, and what he thought of it. It will also be curious if he should alter his opinion about going deeper, and it would be still more curious to learn why he recommended that course in the first instance. But, then, who after seventeen years' experience and study of the stone formation at Morro Velho enabled him so graphically to describe it, as reported in your valuable Journal, will doubtless assist him to say what should be done at Morro St. Anna; but I, for one, protest against acting upon any opinion formed upon a mere superficial inspection of the mine. I shall look for the report with some degree of curiosity.—*Marianna, Nov.* 4. SHAREHOLDER.

ROCK-BORING MACHINERY IN CORNWALL.

SIR,—In your Report from Cornwall, in last week's Journal, we noticed that a test of rock-boring machinery was about to be made under the auspices of Mr. Basset, and you may imagine our surprise upon seeing that a subscription was being raised to defray the expenses of a test of Major Beaumont's rock-borer. We think it is about time that the "parent" rock-borer (the Burleigh) should come in somewhere in this competition; the Cornish miners will then be able to see for themselves which is the original invention and which the copy. Long experience with the Burleigh has brought out its great value as a practical, durable, and reliable machine, as it is now constructed; we are, therefore, content to rely upon the merits of our machinery in the competition, without asking for any subsidy as a guarantee.

A rock-boring machine, before a decision is arrived at as to its merits, should undergo a test—firstly, for its simplicity; secondly, its capability in all classes of rock (not in one special class); thirdly, its durability in the hands of unskilled operators; and fourthly, its handiness, portability, and adaptability. We are prepared upon this basis to send into Cornwall a complete set of Burleigh rock-boring and air-compressing machinery on approval, whether in competition with other rock-borers or otherwise, as may be desired, the only conditions we ask for being that steam power and labour be provided for working the machinery, which will be paid for by the work done, and at the end of the test it (the machinery) shall, if approved, be purchased at our regular prices.

We may add that we are sinking two shafts through very hard Pennant rock near Bristol, and we started with one air compressor and four of our "B" size rock-drills, rather more than a year ago. Will it not surprise the subscribers to Major Beaumont's borer to learn that the same four machines are still at work in the shafts in the hands of ordinary miners, and will doubtless continue to work to the finish, the repairs for the year amounting to 5*l.* on the four machines, and *nil* on the compressor, after sinking 180 yards in each pit, the pits being 11 and 13 ft. diameter respectively.

Further, at the Kiverton Park Limestone Quarries, near Sheffield (Messrs. Turner and Sons), one of our original pattern machines, not an improved one, has been constantly at work for three years, and is still working almost daily, and continues to give great satisfaction.

At the Dowlais Iron Company's Limestone Quarries two of our machines, worked by unskilled labourers, who never saw a rock-borer before, have been putting down holes from 10 to 20 ft. deep, and 2 in. to 4 in. diameter, in very hard limestone, and up to the present time the same satisfactory results are reported.

The great engineering feat of 1876—the removal of the Hell Gate Rocks in the East River, New York, by blasting, was accomplished by the aid of the Burleigh machinery, by which machines the boring was done. Our machines are also employed in the great Sutro Mines, Nevada, U.S.; and in a letter received this very morning from Mr. Joseph Richards, of Virginia City, Nevada (who is a Cornish miner, by-the-bye), he asks what we are doing with the Burleigh, as there is so much talk about other machines over this side, and to use his own words, "You can make all the other companies sick if you take the right steps for introducing your drills."

With these facts before the world, how is it possible that 1000*l.* can be asked for and subscribed in a mining district like Cornwall for trying still another rock-drill, in which we have yet to learn the improvements?

THE BURLEIGH ROCK-BORING COMPANY (Limited).
King street, Manchester, Dec. 12.

AMMONIA ENGINES.

SIR,—Attention has recently been directed to an improved ammonia engine invented by a Japanese chemist—Mr. Toranoske Masayas Nishigawa, of Hiroshima—which, although apparently correct in principle, appeared to require some trifling modification in detail to make it a practical success. The defects appear to have been discovered and remedied, and in conjunction with Mr. F. B. Hill, of Lambeth-road, Southwark, Mr. Nishigawa has secured a further patent, which is described as relating to engines for developing the motive force derived from the vaporisation and expansion of liquid anhydrous ammonia or other substance capable of being obtained and held under pressure in a liquid condition in a suitable reservoir, and which, when relieved from such pressure, will pass into a vaporous or gaseous state. The improvements are more especially designed for the economical use of liquid anhydrous ammonia as a source of motive power. The apparatus included in Mr. Nishigawa's earlier invention comprises a boiler capable of sustaining a pressure of from 200 lbs. to 300 lbs. per square inch; a liquefactor composed of an upward and downward coil or worm; a cooler composed of an upward coil which enters the absorber and is placed within the said liquefactor, and a temperature equaliser composed of a cylinder containing a coil or worm, the cold liquid from the absorber and the hot water from the boiler passing in opposite directions through the equaliser.

According to their present invention, Messrs. Hill and Nishigawa construct an engine whereby the vaporisation, and consequent expansion of liquified anhydrous ammonia are claimed to be advantageously developed into motive-power. The engine has a cylinder of any suitable length and diameter, fitted with a piston, and provided with a port-face, upon which is fitted a slide-valve operated by an ordinary eccentric, or by other suitable mechanism. This valve has in it a cavity or chamber, capable of holding the quantity of liquid anhydrous ammonia to be vaporised at the commencement of each stroke of the piston. From the liquefactor or reservoir containing the liquid anhydrous ammonia under pressure a passage extends to a port or aperture in the port; from the port-face ports or passages extend to one end or both ends of the cylinder, according as the piston is single or double-acting therein; and the said slide-valve is so formed, arranged, and operated that for each stroke of the piston it covers the supply port, whereby its cavity is filled with liquid anhydrous ammonia, and moves therefrom to the cylinder admission port, thereby allowing the ammonia to pass into and expand in the end of the cylinder, its expansion driving the piston forward, then the said valve slides over an exhaust port communicating with the absorber, into which the ammonia is discharged for re-condensation.

Sometimes they modify the construction of the engine by dispensing altogether with a slide-valve, and employing a piston with a cavity, or cavities, arranged to slide over a port or aperture at the side of the cylinder, through which port the liquid anhydrous ammonia is admitted to the cavity, or cavities, in the piston at each stroke, or every alternate stroke, of the same. At one or both ends of the cylinder they form recesses or cavities so arranged that as the cavity in the piston comes opposite one of these recesses the liquid anhydrous ammonia is discharged through the same into the end of the cylinder, wherein it expands, driving the piston forward, as already described.

It is claimed that the invention can be adapted to any particular type or class of engines, and Messrs. Hill and Nishigawa consider

that it is applicable to locomotive, marine, portable, or stationary engines of any form, size, or construction; but in whatever form the said invention is applied or adapted the peculiar feature will be the cavity in the valve or piston so operating as to alternately receive the liquid anhydrous ammonia and discharge the same into the cylinder. In ordinary cases they prefer that the engine should have a cylinder or cylinders into which the liquid is admitted to one end only, the other end of the cylinder or cylinders of the said engine opening into a chamber through which the crank-shaft passes, as in various well-known forms of three or four cylinder-engines wherein the cylinders are arranged radially around a central crank-shaft. The ammonia, after its expansion in the cylinder, is exhausted chiefly through an exhaust port into the said central chamber, wherein it is conducted to the absorber for re-condensation. The piston is in this case secured to the connecting-rod by a ball joint, which forms a valve that closes on the forward stroke of the piston and opens on its return stroke to allow the remaining vaporised ammonia to pass into the said central chamber. It, of course, remains to be seen whether the anticipations will be realised in practice.

Dec. 13. PROGRESS.

THE TIN TRADE.

SIR,—In last week's Journal was noticed a reduction in the tin standards of 3*l*. I have endeavoured to find a reason for such reduction, at present without success. To justify such a drop, no change appears to have occurred in the London tin market since the rise of 3*l*., which took place last month, and the daily quotations show a firmness that would indicate a rise rather than a fall. A correspondent attributes the fall to the state of affairs in the East, but why tin smelters should study rumours rather than the actual market value of the metal I am at a loss to conceive. Being deeply interested in the tin mines of Cornwall, and consequently in the price of black tin, I take the opportunity, which is so graciously and readily afforded by the *Mining Journal*, of expressing the dissatisfaction that is generally felt by shareholders in tin mines, not only in this reduction of the price of black tin, but also in the mode generally adopted by mining companies in selling and by the smelters in buying the produce of the mines. A mine moderately productive sells monthly, generally on some particular day of the month; the parcel of tin is, without being previously weighed or tested by an independent or other assayer, delivered into the works of one of the smelters, where it is weighed, deducting from each sack as it is weighed a certain amount, not percentage, for moisture, returning charges, &c., such amount being determined by the smelter; it is then discharged from the sacks into the smelters' stores, and a sample is afterwards taken and assayed by the smelter's manager, and the price fixed by the smelter. The mine agent may refuse the price fixed, re-fill his sacks, and take the parcel of tin away again, but such a proceeding seldom, if ever, occurs. The smelter, therefore, not only makes what deduction he likes from the weight, but also gives what price he thinks proper to name as the value of the tin, and should he—although in justice I must say such a case has never come under my notice—co-operate with the mine agent the opportunity occurs for his taking other advantages, which it is unnecessary for me to enlarge upon.

Two ways of overcoming the disadvantages that mine companies are under in obtaining the full value of their tin occur to me; firstly, by selling by tender in the same manner that copper is now sold; and, secondly, by smelting their own ores, and selling the metal through a London broker. The latter suggestion may be easily and profitably carried out by any mine or combination of mines producing 50 tons per month. The furnaces required are, compared with the profits they would yield, inexpensive, and very little skill is required in their management. Why the larger mines of the county have not already adopted this plan I cannot understand, but now that materials and labour are becoming dearer, with tin going lower, perhaps some of the more energetic of the managers will advise their employers to invest the necessary capital for increasing their profits, or, as it may be in some cases, of making unremunerative mines into profitable ones.

Two mines immediately adjoining each other have lately had new managers appointed to them, and from all one can ascertain the new men appear able and determined to benefit the companies by whom they are employed. Provided the larger mines do not set the example, could not these two mines join in erecting and carrying on private smelting works? A CAUTIOUS MAN.

Dec. 14.

TIN, AND TIN MINING.

SIR,—From Mr. Hunt's Statistics, published last month, for the year 1875, we gather that there were during that year no less than 183 productive tin mines and stream-works in existence; and your Share List demonstrates that there are only four dividend mines at this date, or even for the year 1876. Hence shareholders received dividends on less than 2 1-5th per cent. of that number—say naught of the many concerns at work which show no returns whatever during the period referred to.

The four mines that pay dividends now all surround the Carn Brea Hills—Dolcoath, 7*s.* 6*d.* per share quarterly; Tincroft, 5*s.*; East Pool, 2*s.*, situate in the northern valley; while South Condurrow, 3*s.* 6*d.* per share quarterly, stands to the south and west. It is curious to follow out the statistics of these properties somewhat in detail. The Dolcoath has been at work for upwards of 70 years, and has been subject to varied and radical changes. For many years it stood forth as a leading copper mine, and from sales of that ore declared dividends of over 300,000*l.*; the returns fell off rapidly down to 1830 and on to about 1840, when shares were relinquished as valueless—while the Messrs. Fox sold out an important holding at 8*l.* to 12*l.* per 175th share (less than the value of machinery and plant). About the year 1835 the late Capt. Nicholas Trediunick, against the advice and in defiance of neighbouring agents and foes in the camp, erected a steam stamping-engine at East Crofty, on the north-east slope of Tuckingmill Hill. The success of this machine and the profitable returns of tin from what many practicals regarded as waste at the time. Capt Trediunick became the pioneer tin miner of the Camborne and Illogan district. From East Crofty, the Dolcoath, Cook's Kitchen, Tincroft, Carn Brea, and other mines turned their attention to tin, and thus Dolcoath from a copper first sprung into a profitable tin mine, and in course of time Tincroft and other concerns followed; but it is worthy of note that neither of these mines would have paid to open from the surface for tin alone. The facts are indisputable. Shafts had been sunk, and thousands of fathoms driven in search of copper, while the requisite pumping and drawing machinery were erected long before the executive ever thought of the profitable existence of tin. These mines, therefore, were neither opened nor discovered by the present managers or their immediate predecessors in office. All that Captains Thomas and Teague have had to encounter is the extraction and dressing of ores discovered by others—*i.e.*, they have had to get the ores out of the mines at the very cheapest and most expeditious methods, and to render them when at surface commercially valuable through economical yet elaborate and effective dispatch in dressing and locomotion to the smelting-houses. From this ore Dolcoath has increased the profits, after a total cessation for 14 years, from 30,000*l.* up to 475,000*l.*, and is still paying 6444*l.* annually. About four years ago the shares (4297 in number) sold at 95*l.* to 100*l.* each, or equal to 2400*l.* for the shares sold about the years 1835 and 1840 at 8*l.* to 12*l.* The present price is 44*l.* to 46*l.*—or, say, 30 years' purchase. The highest price of English block tin during the year 1845 was 102*l.* per ton, and the lowest 81*l.* 10*s.*—the average being about 96*l.* 2*s.* The present price is about the same as the lowest range of the year 1875; and who shall venture to assert that the market value will permanently advance, in the face of the growing discoveries and ever-increasing yield of Australia and the Indian Archipelago?

The importation of tin for 1875 was 16,788 tons, of which the Australian colonies furnished 7210 tons, an advance of 1400 tons on the previous year. Our home mines contributed 45 per cent. and Australia about 23½ per cent towards the supply. Although Cornwall and Devon show a falling off of only 44 tons in the quantity of ores, yet the metallic product was 328 tons less than in 1874. Hence the average quality was materially diminished. This cannot arise from deteriorated machinery or dressing paraphernalia, but from the poorness of the ores, and the immense bulk of stone required to be pulverised and separated in dressing operations, in order to raise up the produce of black tin to 68⅝ per cent. of metal.

To become a successful investor one must possess knowledge, judgment, nerve, and money. Knowledge is the product of study; judgment is a natural gift, assisted by knowledge, and, indeed, indispensable without study; nerve is also a natural gift, but that, too, may be cultivated by the abnegation of excess, and by moderation in all indulgences; while the possession of money may be inherited or acquired through the industry of the possessor; but each and all of the four—knowledge, judgment, nerve, and money—tell us in plain and graphic language that the results of Cornish and Devon tin mining were 134 unremunerative, yet productive, tin mines to four paying ones for the year 1876, and which in the aggregate declare dividends of 19,290*l.* only, or less than 5 per cent. on a market value of 400,000*l.*, while these four mines alone sell for 190,000*l.*, 150,000*l.*, 75,000*l.*, and 47,500*l.*, or together 462,500*l.* The Van Lead Mine, in Montgomeryshire, is paying 48,000*l.* a-year, or close upon 150 per cent. advance on all the tin mines of Cornwall and Devon.

It is absurd to shut one's eyes to the fact, or to steep the mind in forgetfulness of the consequences to shareholders in embarking capital into tin mining upon other than philanthropical principles—as, for example, 138 mines last year realised tin ores for 735,606*l.*, and the merchants and smelters re-sold the metallic tin for 866,266*l.* Thus, we have the figures—landlords, labourers, merchants, tradesmen, bankers, and executives, 716,316*l.*; smelters, 130,640*l.*; and shareholders, 19,290*l.*: minus calls on 134 productive, though unremunerative, other concerns, in addition to the host of projects and schemes which are supported solely and wholly from calls.

In conclusion, no foreign stocks nor bonds can prove less remunerative than Cornish tin mines, and anyone who is not a philanthropist, a millionaire, or landlord should pass them with silence, or only refer to them as emblems of past successes rapidly passing into oblivion. Country parsons, retired tradesmen, spinsters, and trustees, together with all others who rely upon revenue from the application and employment of their capital for sustenance should cease to recognise them as profitable investments.

There are mines of iron and of coal, of lead, and of blende that teem with untold wealth, and which languish for want of capital to develope and realise the riches of their hidden store-rooms. Why, therefore, should we pine because the community at large is happily benefited through the importation of foreign and colonial tin, though the sparse and unremunerative miners of Cornwall temporarily suffer from depreciated and lessened prices which their ores command. Free trade has done as much for Cornwall as for any other district in Great Britain in proportion to its products and requirements, and it will prove a boon to the community at large should metallic tin permanently fall to 50*l.* a ton. Manufacture, constructive and sanatory reforms and enterprises require cheap tin; and the interests of all members of the commonwealth are enlisted in the increased and economical production of this metal, save and except Cornishmen, who cannot live through their metallic productions unless bolstered up by protective and exceptional advantages, antagonistic to trade, manufacture, and commerce, and opposed to the general progress and expansion of social and civil reforms identified with the indispensable requirements of the commonwealth.

Dec. 15. R. TREDINNICK,
Consulting Mining Engineer.

GOLD MINING AS IT IS—THE CLOGAU COMPANY.

SIR,—It is satisfactory to find that after nearly 12 months spent in "feeling their way" to a profitable system of extracting gold from the Clogau ores the directors now fully realise the value of the opinion given in writing to one of their number in December last—"That the system of gold extraction then being attempted to be carried out at Clogau must sooner or later end in disappointment to all parties interested." At an interview with two of the directors in February I repeated the same advice; and in the *Mining Journal* of May 6, after giving an outline of the operations then in use at Clogau, I wrote, "Such is an outline of the stamping operations at Clogau, which I venture to assert will never succeed in returning a profitable percentage of the assay contents of the mineral. The extraction of free gold is in itself a simple operation. On the other hand, when gold is combined, as in the Clogau ores, with foreign substances it cannot be readily extracted, and requires special treatment."

The next issue of the Journal contained a letter written (at the instance of the directors) by the secretary of the Clogau Company, commenting on my statements, justifying the action of the directors in "feeling their way," and concluded by suggesting that my remarks were dictated by an unworthy motive. In fact, I have no hesitation in saying that my condemnation of what was being attempted at Clogau was attributed to prejudice. But whatever may have been the impression on the minds of those who asked my advice, it is evident my prognostications have been confirmed, and that the directors "have veered round" to my opinion, as in the *Mining Journal* of Oct. 28 we are informed. "The Clogau Company held its ordinary general meeting at Sheffield, and from information elecited from Mr. Williamson was to the effect that recent experiments had demonstated that the ore can be made to profitably yield from 8 to 10 dwts. of gold per ton irrespective of the free gold. Hitherto the difficulty has been to save the gold by ordinary amalgamation. It is now proposed to simply concentrate, and sell it as gold ore, for which there are many buyers." At the same meeting a resolution was passed to raise 5000*l.* to complete the necessary alterations to the machinery and provide working capital.

Here we have a distinct admission that the gold could not be saved by ordinary amalgamation, "therefore it is now proposed to simply concentrate and sell it as gold ore." It would be very interesting to know the amount of capital which has been frittered away during the last twelve months only in "feeling the way" to the adoption of this proposition. If further evidence is required to prove all that I have advanced in reference to what has been attempted at Clogau, and what should be done with such ores, it will be found in last week's Journal, from which I quote the following:—"The Gold (Welsh) Company remind their shareholders of a fact that has constantly been repeated in the Journal during the last 20 years. That it has been ascertained from the working of the Clogau Mines that the Welsh gold is in combination with certain other minerals, which has hitherto prevented the quick-silver taking up more than a small quantity of gold—the other portion being lost—rendering a peculiar method of treatment necessary. The sodium and various other processes were tried, and failed, but it is said that, judging from the experiments recently made, it is at last in a fair way of being discovered. A furnace and other suitable apparatus for calcining and otherwise treating the ore are about to be provided. The successful carrying out of these works will be regarded with much interest, and many believe that the works now going on at Clogau will soon prove that gold mining in Wales can be made a well paying industry."

This, I consider, is the strongest and best evidence which can be given to substantiate all that I have asserted, and fully confirms the remarks contained in my letter of May 6, especially in reference to the treatment of Clogau ore; as well as many of the arguments and facts which I vainly endeavoured, near twelve months ago, to impress upon some of the directors; and, although I was unable to convince them of their error, it is satisfactory to know that others have so far succeeded.

In exposing, and if possible preventing a continuance of, the blundering and insane attempts which have been made to extract gold at Clogau I have had but one object in view—the benefiting a large mineral district which has never yet had justice done to its auriferous deposits. Alternately at the mercy of quacks and adventurers, ignorance and impudence have at various periods played most "fantastic tricks" with large sums of money drawn from their unsuspecting dupes, inflicting an incredible amount of injury, and delaying the development of its auriferous wealth, which only awaits the application of well-known principles rightly applied to make gold mining in Wales a most legitimate and profitable operation.

On my return to England, in 1870, after a residence of many years in Australia, I visited the district, and the impression made at that date has not been effaced by later visits; on the contrary, it has been strengthened by visits to other gold-producing districts, and I feel assured that when the treatment of the ores is properly understood gold mining in Wales can be made to pay. The latest programme to effect this desirable result is a step in the right direction, and will, if rightly applied, deserve success. C. J. HARVEY.

Moorgate-street, Dec. 14.

SLATE, AND SLATE QUARRIES.

SIR,—I have just returned from the North Wales slate quarries, the owners of which are pressed on all sides to execute orders of long standing, and on which the money has been paid in advance in very many cases. This mode of payment has been done for a long time by anxious purchasers for the purpose of getting orders for slates accepted, to be delivered as soon as convenient to the slate quarry company or proprietor, and although our foreign demand is rapidly increasing to such an extent that it would be quite enough to keep up a good steady trade, at the same time we have a home demand which in a few years (if the increase of population is to proceed on the same ratio as during the last few years) will produce a demand quite equal to all our quarries will do unless greatly extended. In January, 1859, our population stood at 19,686,701. In January, 1876, we had increased to 24,244,010 an increase of near 5,000,000 of persons, and for whom houses have been or are being provided, with all the additional requirements for the age, such as schools, churches, chapels, works, shops, &c., and as slates are, and ever will be, used as the covers for buildings, owing to their light weight being such as to enable architects to construct roofs with a very small cost for timber compared with that required for tiles, we may, I think, look forward without doubt that this branch of industry (slate quarries) is safe to flourish for a considerable period. Yes, we may almost say there will ever remain an increasing demand, and as of late years water cisterns, baths, &c., made of slate have been found to be far better than any other, the demand for this description of produce is found to keep pace with that for slates. The price of slates is now very high compared with what it was some time ago, and on Jan. 1 next a further advance of 5 per cent. is declared. FIRST BORNE.

Great George street, Westminster, Dec. 12.

LEGITIMATE MINING IN CARNARVONSHIRE.

SIR,—The supporters of legitimate mining will hail with satisfaction the attention now being directed to the mines of Carnarvonshire. Mr. J. Y. Watson has taken one or two of these in hand, and good results under such competent management will, doubtless, speedily ensue. The Tan-y-Bwlch has recently been transferred to a limited company, and other mines in the district are being enquired for. There can be little question as to the great advantages possessed by the Welsh lead and copper mines, they having as a rule abundant water-power for all purposes, and great facilities for working by means of short adits, whilst the ore is found at comparatively shallow depths, and in the case of copper ore the percentage of copper is in most instances more than double the average yield of the Cornish copper ores. There would appear to be a very promising future before the Carnarvonshire mines if only they are honestly and efficiently managed. OBSERVER.

WHITE CLIFF MINES, LLANRWST.

SIR,—In the last issue of your valuable Journal you have a short enquiry from a shareholder, like myself, in the above mines respecting the prospects of the same. I have also visited the mines recently, and went down the Alltwen Level Shaft, and made a thorough inspection of the workings. With your permission, I append my experience. To the south forebreast of the present workings, at a depth from the level of about 40 yards, I was glad to find one of the finest courses of nearly pure galena I ever saw in that district; and again receding to the north end of the same working I discerned above and below a continuous deposit of a similar strength and quality of ore, ending in equally as good a hold in the north end as it was south. In fact, I can say without any hesitation that I have known that mineral district for a quarter of a century at least, but I never saw a finer and more wholesome prospect of a good and permanent mine.

During the last few years science has advanced with extraordinary strides, and has assumed in consequence the utmost importance in the minds of men. At the time when I first knew the district the progress in engineering was comparatively slow, and to that, I have no doubt, can be attributed the non-development of this rich lead-bearing district; but now I am glad to find that energy, combined with first-class engineering skill on the part of our neighbouring mines (Willoughby and Llanrwst), will be more than effectual in clearing the dark cloud of ignorance that has for years hovered over this broad area of mineral wealth. Mr. Knapp, the manager of the Llanrwst Mines, has most worthily erected powerful machinery for winding, pumping, crushing, and dressing the many hundred tons of ore that he has broken above and below; and with that *modus operandi* he can, without a doubt, realise to the shareholders what he has continually contended and boldly asserted—"a succession of successes of different magnitudes."

But after all I am sorry to inform "A Shareholder" that I felt despondingly sorry to find that the fine pile of stuff, containing, according to the estimate of the two captains, more than 50 tons of splendid ore, is being dressed by hand in the most aboriginal way. Such a course of procedure on the part of any directors, to say the least, is really most unwise. The different residues and tailings with such a process contains more lead ore than what the Van Mine stuff from below through and through contains; I got it assayed, and it yielded by an ordinary fire assay from 20 to 25 per cent. of lead; this system must be abandoned, and proper dressing machinery put up instanter. I was also astonished to find that the engine, sent down by one of the directors' orders, was totally incapable to work that strong course of ore from and under the Gorlan adit, and that neither the Red Lode level in the Alltwen, nor the Sarnan level in the Gorlan sett, are being driven. Had this been done I can say, without any doubt whatever, that at the present moment we would be working on four very strong courses of ore, and instead of the last two small lots of ore, neither of which exceeded 10 tons, at least 50 tons of ore would have been ready to realise 15*l.* 10*s.* per ton. I am not for myself willing to sell a single share, even at a premium, when a small outlay for proper dressing machinery is made, and the same put up rightly. Such a mine as White Cliff cannot fail to yield its vast treasure, and that most remuneratively.—*Dec.* 13. ANOTHER SHAREHOLDER.

WHITE CLIFF LEAD MINE, NEAR LLANRWST.

SIR,—Referring to the letter in last week's Journal, I can fully confirm the favourable opinion respecting this mine contained therein. In reply to your correspondent's enquiry as to the price of these shares I can inform him that the reason they are not quoted at a high premium is simply because they are all held by private investors, and not by brokers or speculators for a rise; the capital being so small it has never been necessary in even the early days of the company to employ outside means to place the shares, and now that the undertaking is proved beyond any reasonable doubt to be a great success, I am informed that no more shares than the 3000*l.* lately offered will be issued. These have been freely taken up, and I hear that the machinery will at once be ordered. Taking the capital as it now stands (including the 3000*l.*), and bearing in mind that the captain states that even with the present appliances regular monthly sales of not less than 10 tons will be continued from the lode now being worked in the Ralltwen sett, and another 10 tons from the Gorlan at the beginning of the year, it is absurd to suppose par to be the true value of these shares; and when the output is increased and the costs lessened by machinery, there is every probability that they will be worth 10*l.* or 12*l.* each. Those who hold shares will certainly get a good dividend next year, as monthly sales of 10 tons will pay 6 per cent. dividend, 20 tons will pay 15 per cent., and 30 tons 24 per cent. at present prices. There is no reason why, when the machinery is fixed, the sales should not be raised to 50 tons per month—25 tons from each sett, and the proportion of profit on each ton will, of course, be larger with the in-

proved dressing. Your correspondent is willing to take more shares, but he does not say at what price; he certainly will not get them at par, as I understand from the secretary that the whole of the 3000*l.* are disposed of. ——— WHITE CLIFF.

LLANRWST MINE.

SIR,—A few days ago I received a circular from a promoter of the above company by which I was informed that Mr. Endean had secured all the shares the directors would dispose of at the present time. Would the secretary or the directors kindly inform the shareholders by what authority they disposed of the same, and why they were not offered *pro rata* to present shareholders, and would the secretary inform us at what price the said shares were sold. Do the directors know anything about the price, or are they indifferent to the market value. If the large sales of lead which have been long promised were being made one might hope on, but in the absence of such and many irreconcilable statements and facts I sign myself—
Dec. 11. ——— ONE PERPLEXED.

LLANRWST LEAD MINE.

SIR,—Will you permit me to inform "A Shareholder," whose anonymous letter reached me this morning, and who professes to speak for several others besides himself, desirous of being informed when it is probable the engine will be set at work, that everything is being done that man ought to do to hasten that much-desired event. No one can be more fully impressed with the importance attaching to the completion of the necessary means for bringing our ores into the market than myself. But the prevailing inclemancy of the weather puts it entirely beyond my ability to state positively when it may be done. If moderately favourable weather occurs it will be done in about a month from this time. The pitwork is all fixed in the shaft, the engine is nearly completed, the stack is finished, the building of the boiler-house is well advanced, and the shaft balance-bob pit is in course of construction. It will, therefore, be seen that it is a question of the weather as to what time the work will be finished. Our exploratory points continue to open well, and everything thus far is favourable to a successful future.
Dec. 14. ——— ROBT. KNAPP.

CORNISH MINING.

SIR,—I have just observed in one of the reports in the Journal the following passage:—"We shall commence forthwith to be let down the shaft, &c., in order to send the kibbles to the bottom of the mine to haul away the stuff therefrom." Supposing this to mean in this case horse-whim kibbles, and that in sinking the shaft the windlass was used, I would ask if it is not time such slow and antiquated modes of working were ignored, and my Cornish brethren tried to move a little faster. It is a long time since I pointed out in the Journal that a great saving in time and money might be effected by hauling the stuff by other than manual labour, direct from the bottom of the shaft as being sunk, and after years of experience I can see no more danger in doing this with the steam-whim kibble or skip than with the tackle. Were it not, however, that this is but a sample of the snail-creep pace at which Cornish mines are worked I might not have troubled you now, but the present time seems to me opportune for abolishing many of the vicious customs which have been the bane of my native county, and I should like to see "tuck pipes," pay-days, aye, and pursers too in many instances, setting days, and mazed Mondays done away with, for it is such customs that are the canker worms eating out the life of Cornish mining. It would be an easy calculation to show that the time wasted is the dividend lost; pay-day dinners are very comfortable things in Cornish account-houses, though many is the day since I tasted one, and I never wish to taste another until I see the time when the working miner can have a chance to earn at home that which now he has to seek elsewhere—pay for his work, for only pay him for working and he will readily work six days (shifts) a week—at least, Cornish miners do so for me—and never grumble. We hail with joy the advent of the drilling machine, but many are still sceptical as to its utility, which is not to be wondered at, seeing it has been abandoned after vigorous trial in places where labour is far more expensive than it is at home, and where things are not usually done by halves, and if it is successful the miner must still be taught that "industry maketh rich," and how can this be done better than by the agents showing him they are anxious to adopt the speediest methods of developing their mines, and willing to pay him if he is willing to work.—*Nova Scotia, Nov.* 28. MINE AGENT.

DEVON CONSOLS ARSENIC.

SIR,—Should the controversy on this subject be prolonged in the *Mining Journal* it is to be hoped that correspondents will take some little pains to make themselves acquainted with the real state of the question on which they write. A correspondence, extending over a period of months, took place some while ago, in a paper published in Cornwall, during which crude arsenic, or soot, was confounded with the refined article, and with this limited knowledge of the matter some very out-of-the-way suggestions were made with reference to the mode of sale. Some remarkably inaccurate quotations were also given as to the prices obtained for refined arsenic, with statements in other respects that would not bear the test of examination; and, judging from the result of that correspondence, it appeared very clear that no manufacturer would be likely to gain much by sending arsenic down into Cornwall for sale to other manufacturers in the same trade. According to public records, Devon Consols have been by far the greatest manufacturers of arsenic in the world, it may, therefore, fairly be supposed that the directors have arrived at a little knowledge of the market value of this commodity, and that they for their own benefit, as large shareholders, as well as for the good of the company whose interests they represent, have not allowed the Devon Consols arsenic to go under its fair marketable value.—*Dec.* 12. ——— OBSERVER.

NORTH LAXEY MINE.

SIR,—The sump, or sinking, in the 121 north in this mine is reported to be at present worth 2 tons per fathom, and the forehead of the 136 north, now being driven towards this sump, becoming productive; but I understand the latter level has to be driven a considerable distance before it arrives underneath the sump referred to, and that, as the ore ground may be dipping north, the lower level will have to be driven still further than the line of the sump before it enters the bunch of ore seen in the level above. If this be the case, it would seem best—considering the comparatively small amount of capital now available—for the interests of the present shareholders to reserve sufficient funds to drive the 136 up to the ore ground, and defer the expensive work of sinking the shaft until this is effected, when we may reasonably expect increased and regular sales of ore. The sinking could then be resumed with better prospects of the funds necessary for the effectual deepening of the mine being forthcoming, and the present shareholders reaping the benefit of the work already done. F. S.

MINE AGENTS.

SIR,—"Nemo," in last week's Journal, takes a remarkable view of things. He seems to think that the "risky" nature of mining is attributable to the low salaries paid to the agents! This is a novel view, indeed. The agents in general are men taken from the labouring class in mines, and for the reason that the actual workers in mines are the best able to direct the works in mining, from their knowledge of the price that should be paid for sinking, driving, &c. If labouring miners get by their labour 4*l.* per month to-day, and are made agents to-morrow at 8*l.* per month, I do not think that they ought to grumble. A late manager of Carn Brea could neither read nor write, but he knew how to direct the works well. I would not advocate the placing a man in any situation of trust who was so ignorant as that manager; but the fact shows that, so far as the development is concerned, very little book learning is absolutely wanted. "Nemo" writes of agents being required to possess an amount of knowledge which none or few of them possess, nor are they expected to possess. I believe that agents, in general, are paid as much as they deserve, and many of them a great deal more. There are two or three agents in Cornwall receiving from 500*l.* to 1000*l.* a year, and they get it without very much labour, and attend to a variety of other matters; but they do not deserve so much, in my opinion. The time has arrived when education is valued, and young men are now awake to the importance of mental cultivation and the acquisition of scientific knowledge bearing upon their several callings and occupations. The mining classes formed in Cornwall are doing much good; and the Mining Institute, recently formed, will increase the facilities for disseminating useful mining knowledge. Owing to the depreciation of the price of metals (copper and tin), an increase of knowledge is necessary to cheapen the processes of production. OBSERVER.
Callington, Dec. 14. ———

CARN BREA AND TINCROFT.

SIR,—On perusing the reports of the last meetings of the shareholders in Carn Brea and Tincroft mines, I found that the costs were charged up to the end of June, but that the ores sold were credited up to the latest date. In Tincroft a dividend was declared, while the costs for July, August, September, and October months were not charged, although actually paid. Do you think that is a business-like way of keeping accounts? The costs and receipts should be contemporaneous—both brought up to the end of October—that the balance against the companies might appear. I do not approve of "cooking" the accounts. However desirable a dividend may be it should never be given illegitimately, as appears in this case. The money to pay the four months' costs in arrear must bear interest, which is not inconsiderable on a sum of, perhaps, 10,000*l.* I take the liberty of suggesting that all pursers charge their costs and receipts up to the same day, that the shareholders and investors may know the real state of affairs, and not be misled in their investments. Distant investors may be ignorant of the uncharged costs, which, as in Clifford Amalgamated, may come upon them as a surprising evil.—*Redruth, Dec.* 14. ——— J. P.

NEW CONSOLS.

SIR,—I am a constant reader of your valuable and interesting Journal; and sometimes, when I see occasion, I like to send you a few lines with respect to mines. The last number contains a letter bearing the signature of "E. S. P.," who wrote after an inspection of the surface operations in New Consols. Your readers are, doubtless, almost weary of the oft-repeated statements respecting the discoveries in that mine, concerning which the world is now pretty well enlightened; and if the company had taken the advice of their manager, of dividing profits of 1000*l.* per month, "the mine would speak for itself," as people say; but the directors have chosen to "call up" additional capital of 24,000*l.* to augment their returning power—a procedure unusual in this county. It is usual in Cornish mining to call up capital only when wanted; but in this case it was not wanted; so that persons are led to ask what was meant by the late "winding-up," and "re-construction" of the company? Was it to reduce the number of proprietors by pushing out those who could not contribute their quota of the 24,000*l.*? I ask for information. "E. S. P." is in error in saying that the old miners here worked for tin and copper—they worked for copper only—the presence of tin not having been discovered prior to Capt. R. Pryor's taking the mine. The writer calls it "a plucky undertaking." I admire the conduct of the shareholders in so freely responding to the calls for money to carry out the works to their present extent; but the call of 24,000*l.* should not have been made. The enlargement of returning power should have been out of profits, which Capt. Pryor offered. I have read a good deal of Capt. Pryor's labours in connection with New Consols, and a good deal of praise (well-deserved) has been given him; but I have yet to learn that a man can live on that element. Something more tangible is wanted than compliment. I have been told that he has never had any reward for his extra and unprecedented labour and perseverance through difficulties but a small monthly salary. He ought to have a month's profit of 1000*l.* presented to him. OBSERVER.
Callington, Dec. 14. ———

THE PNEUMATIC STAMPS.

SIR,—I beg to thank you for the insertion of my previous letter, and to add the following particulars:—The weight of the large head of the pneumatic stamps at this mine is 800 lbs., and that of the two small ones 340 lbs. each, including everything attached giving force to the blow. The diameter of the large head is 11½ in., and of the small ones 8½ in.; height of head, 14 in.; number of blows per minute, 142. There are three grates to each copper, each 1 ft. 9 in. square. The number of holes to the inch 32, being about the finest in general use. The stuff we have been stamping is about one-half rough selected stuff from the burrows, and the other half of a finer character, together averaging about the size and hardness of the tin-stuff of the county. Repeated comparative trials with the two heads in one copper, and with the single large head, have shown no appreciable difference in the performance of the two sets. At a special trial with the single head, the hardest stuff produced in Dolcoath Mine was stamped at the rate of over 16 tons in 24 hours, in the presence of Capts. Josiah Thomas and Pearce, and Messrs. Loam and Son (the manager, tin dresser, and engineers of that mine), who expressed their high satisfaction at the result. For the reason stated in my letter I am desirous of giving the fullest particulars, and also because I am satisfied, from the experience we have had, especially in the case of new mines about to lay out floors, the introduction of these stamps will prove to be a great stride towards that increased economy in the preparation of tin for the market which is now become a pressing necessity. I trust what I have said will be satisfactory to your correspondent, who I am sorry did not think proper to attach his name. An anonymous correspondence on practical matters can hardly be productive of much good.
Great Wheal Vor Mine, Dec. 14. S. HARRIS.

[DISCLAIMER.]

LORD MAYOR'S COURT—ETHERINGTON v. WARD.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—With reference to the above action, I beg to inform you that I am the only Member of the Stock Exchange bearing the name of William Ward, and I was not the defendant in the case.—*75, Old Broad-street, E.C. Oct.* 28. WM. WARD.

THE DEVON AND CORNWALL COPPER, MANGANESE, AND MANGANIFEROUS IRON ORE COMPANY.—We have lately advocated a more extensive development of those rich deposits of manganese and of the iron ores usually associated with that metal which exist in a long tract of country in the counties of Devon and Cornwall, so that we may be better able to cope with the rapidly increasing demand which is being made for these ores, and also to render us more independent of those foreign supplies, of which there is so much uncertainty. As "coming events cast their shadows before," we have from time to time during the last few months had the satisfaction of noticing in the Journal many indications of coming activities among those works which are situated near the River Tamar; and to-day we are pleased to find that a prospectus of a new company has just been issued under the above title, with a nominal capital of 40,000*l.* This company has taken extensive powers under its Memorandum of Association, and secured a group of properties which contains miles of manganese, miles of rich copper ore, and some hundred acres of manganiferous iron ore of high percentage, besides ochre and lead, which the properties also contain. Among the several features worthy of special notice in the prospectus is that of the total absence of conjecture. It states facts, not probabilities. The properties are in a high state of development. There are no searches to perform, no uncertainties to encounter, no shafts to sink, no adits to drive, no great expenditure to incur, nor length of time to wait before the shareholders can have returns. The undertaking appears far beyond adventure; the sickening preliminary work is ended; the lodes are laid bare; the men are at work; the ores are on the market—cargos having been shipped, and the actual profits ascertained. "In this way (says the prospectus) every element of speculation has been removed and a basis established of the most sound and reliable character for the formation of a public company capable of carrying on the work with energy." The analysis of the ores are given by no less than six different assayers from actual cargos as sent into the market, and the examination and reporting upon the properties have been entrusted to a Westminster engineer and a gentleman connected with the Devon Consols. Both of these reports stand in striking contrast to the usual productions of the kind. Accompanying the prospectus is a coloured map of the locality, showing the properties and their proximity to railway and water carriage to the towns of Tavistock and Launceston. We notice that considerable local interest has been taken in the company, and we learn that adequate support is promised from London, Manchester, and Liverpool. We also learn that profitable contracts are being entered into, and that before the end of the year the company is expected to be fairly launched. Mr. W. H. Brand, of Great George-street, Westminster, is appointed secretary *pro tem.* We sincerely wish the company every success, and consider the undertaking worthy of the due consideration of investors.

THE TIN TRADE.

In a circular issued by one of the leading metal brokers the following figures are given. From Jan 1 to Nov. 30:—

	1876—tons.	1875—tons.
Straits shipments to London, including subsequent transhipments to New York ...	6,487	6,729
Straits, direct shipments to New York ...	1,788	3,260
Australian shipments	5,200	5,892
	13,475	15,871
Deficiency in shipments for the 11 months...	2,396	
Total	15,871	15,871

As these figures do not account for the enormous accumulation of stocks, we hereby give the actual figures, with full details. The shipments to London from Jan. 1 to Nov. 30, including transhipments to New York, were 7099 tons, and not 6487 tons.

STRAITS SHIPMENTS—1876.

Jan.—Per Galatea ..	..Tons	224	June—Per Glenlyon	..Tons	68
Anchises		125	Glaucus		209
Ajax		292	Glenfalloch		42
Malwa		15	Ajax		77
Deucalion		355	Braemar Castle		80
Surat		52	Anchises		50= 732
Glenroy...		94	July—Teheran		240
Thames...		61=1218	Tchihatchoff		36
Feb.—Sarpedon		375	Deucalion		80
Egeria		30	Thibet		272
Amsterdam...		10	Montgomeryshire ...		74
Peshawur		25	Flintshire		56
Australian		31	MacGregor		15
Priam		347= 818	Sarpedon		85= 822
March—Ulysses		274	Aug.—Suez		30
Menelaus		164	Peshawur		227
Stentor		146	Priam		173
Poonah		20	Thingwalla		31
Siam		24	Indus		51
Mirzapore		44= 671	Lord of the Isles... ...		45
April—Bastian Pah		15	Nankin		36= 592
Diomed...		169	Sept.—Achilles		170
Malwa		45	Stentor		78
Patroclus		89	Siam		94
Cathay		30	Zambesi		23= 410
Deccan		25= 373	Oct.—Ulysses		25
May—Nestor		170	Patroclus		45
Agamemnon		175	Hesperias		143
Hindostan		65	V. de Gama...		27
Glenartney		76	Nestor		25
Glencairn		75= 561	Maharajah		161
June—Fleurs Castle		25	Deccan		25= 451
Antenor		109	Nov.—As telegraphed by Reuter ...		510
Cawdor Castle		43	Total	..Tons	7099
Glenfinlas		65			
Lombardy		75			

The shipments from Australia for the same period were 6071 tons, and not 5200 tons, as per following details—

AUSTRALIAN SHIPMENTS—1876.

Jan.—Per S. Plimsoll ..	..Tons	59	April—Wave of Life	..Tons	82
J. Duthie		100	Ann Duthie		145
A. Rose...		108	Martaban		7= 733
Pekina		64	May—Hampshire		64
Yorkshire		2	Canopus		30= 94
Locksley Hall		48	June—Northumberland ...		147
Hydaspes		2	Arab Steed		74
Rydall Hall		208	Cynosure		225
Decapolis		25	Loch Lomond		40
Bercan		54	Belle		50
Tom Duthie		120	Loch Tay		60
Westbury		24= 816	Alex. Duthie		240= 826
Feb.—St. Osyth		148	July—Nyassa		70
Paramatta		147	Agamemnon		87
Somersetshire		2	Armosie...		65
Norfolk		5	Essex		42
Duke of Sutherland ...		149	W. G. Russel		85
Ninevah...		91	Andrew Reed		159= 601
Erato		111	Aug.—Strathdon		16
Aramah		39	Lincolnshire...		97
Sobraon		26	Glenelg		150
Carlisle Castle		5= 721	William Monarch ...		111
March—Thomas Stephens...		87	Kosciusko		76= 449
Cairnbulg		159	Sept.—Somersetshire		97
Aviemore		27	M. Luther		178
Darling Downs		82	Rooparell		211
True Briton...		75	Indus		10= 496
Skimmers of the Wash		5	Oct.—Jerusalem		142
Superb		5= 410	Abergeldie		113= 225
April—Durham		106	Nov.—According to all telegrams received		800
Windsor Castle		104	As confirmed also by the circular quoted above.		
Glencairn		128	Total	..Tons	6071
Newcastle		50			
Fugitive...		60			

The shipments from Australia for the same period of 1875 were 5701 tons, and not 5891 tons:—

AUSTRALIAN SHIPMENTS—1875.

January	..Tons	637	August	..Tons	353
February		524	September		412
March		476	October		631
April		500	November		555
May		322			
June		588	Total	..Tons	5701
July		674			

There is, therefore, an increase in the shipments from Australia of 370 tons, instead of a decrease of 691 tons, as stated.

We further find in the same circular a statement that America has taken this year "800 tons short of last year," whilst in reality America has taken the following quantities. Jan 1 to Nov. 30:—

	1876—tons.	1875—tons.
English tin	684	770
Singapore and Penang, direct and indirect, up to Oct. 31...	2265 }	2384
In November, as telegraphed by Reuter ...	640 }	
Straits, direct from London warehouses ...	90	—
Banca and Billiton	46	33
Total	3725	3724

We also append a statement of deliveries showing that far from there being any increase in consumption there is a considerable decrease:—

	Tons.		Tons.
1876—January	1121	1875—January }	
February	1335	February }	
March	1324	March }	
April...	1120	April }	
May	1142	May }	
June...	1613	June }	22,227
July	874	July }	
August	995	August }	
September	842	September }	
October	1021	October }	
November	1025=12,411	November }	
Less Banca and Billiton:—			
January	3		
February	3		
June	16		
July	6		
September...	60		
October	110		
November...	9= 207		
Australian tin transferred from warehouses in London to Amsterdam awaiting sales and still lying there	765		
Banca			259
Shipments overside to America	...1732=2,704	Shipments overside to America	928=1,170
Total	..Tons 9,707	Total	..Tons 11,056

The Dutch deliveries are about 300 tons more than last year, which

in face of 300 tons Banca, as well as 300 tons Billiton offered for sale in excess this year, need not be taken into consideration.

HOLMBUSH—ITS FORTUNES AND MISFORTUNES.

In this mine we have a striking example of the vicissitudes that often attend the search after mineral wealth, and that sometimes, as in the cases of Great Wheal Towan, Levant, Devon Great Consols, Van, and other mines, have led to the production of almost fabulous riches from undertakings which at one period of their history were plunged in the deepest adversity, or were altogether abandoned. More than a generation ago Holmbush was esteemed one of the prizes of Cornwall; at the Great Exhibition of 1851 its huge rock of lead and silver ore, upwards of ½ ton in weight, and the splendid model of its surface and underground works (now in the Geological Museum) were regarded with keen interest and wonder; a decade later, and the mine was utterly abandoned, to remain waste and desolate with but one short interval of attempted resuscitation, until four years ago it was re-opened, and has been suddenly restored to well nigh its ancient prosperity.

The history is, moreover, instructive, as showing how the vicissitudes of which we have spoken are mostly the results of outside causes, and are seldom to be attributed to the intrinsic merits or demerits of the mine itself. When Holmbush * was first worked a magnificent shoot of copper was discovered dipping west in the hole. This shoot was followed down with great vigour, and yielded enormous returns of exceptionally high-class ore, until at length a depth of 200 fms. from surface was reached. Here the course of ore was found to be richer than ever, but owing to the improvident manner in which it had been wrought the miners found themselves confronted by obstacles strong enough to baffle their utmost resolution and endurance. Level after level had been driven forward in succession by sinking a series of winzes far away from the shaft, and no care had been taken to extend them back to the shaft. The ends and stopes, therefore, became less and less ventilated, and every drop of water and ounce of ore or attle had at length to be raised and hauled by manual labour up and along what were in reality a flight of gigantic underground steps until a level communicating with the shaft was reached. The time, therefore, inevitably arrived when it was physically impossible for the men to continue working without the provision of readier means of access to the ore, and this, of course, involved either the sinking of an additional shaft or the direct connection of the existing one with the bottom stopes and ends. To defray the requisite expense a reserve fund should have been set aside out of past profits, but this had been disregarded. Moreover, instead of staking the existence of the mine on the continuance of a single course of ore, however rich, a series of explorations should have been kept in progress so as to open up other metallic deposits. Every prospect existed of meeting with fresh shoots eastward in the same lode, and at a short distance to the south a parallel lode of greater thickness and promise than the original Holmbush lode had been proved to exist by cross-cuts at several levels, and had where wrought upon yielded excellent returns. A magnificent lead lode also crossed these two lodes in a north and south direction, and in the adjoining Redmoor sett had produced very large and rich deposits of lead and silver. Hence there was ample opportunity for developing abundant reserves of ore to provide costs and pay dividends, while the working of the main shoot should be temporarily suspended. But no such foresight had been displayed, and when it became necessary to make calls instead of dividing profits, disunion set in amongst the shareholders, and at last, owing to the refusal of one of the most prominent members to pay his call, the remainder in an access of indignation gave orders to close the mine, and sell off the machinery. Thus it happened that with the full knowledge of all concerned this large and wealthy mine was abandoned, although a splendid course of solid copper ore was lying exposed to view.

It should here be mentioned that in the process of driving and sinking many thousands of fathoms of levels, shafts, and winzes, in pursuit of the copper, much of the lode had been passed through as dead ground, simply because it did not contain a sufficiently high percentage of that metal. Far, however, from this "dead ground" being barren the lode in such places was found to consist of mispickel, or arsenical mundic, in such vast quantities and of such purity as to constitute a hitherto unequalled deposit of that mineral. In those days arsenic had not attained its present important position among the raw materials of manufacturing chemistry, and no process had then been devised for extracting the copper and silver, which (with an appreciable trace of gold) usually accompany mispickel. It followed, therefore, that the Holmbush mundic, wonderful though it might be for quantity and quality, was left untouched, and if by chance any had to be broken in the course of working it was piled up in the stulls, or thrown over the burrows with the ordinary attle and halvans.

When the mine was abandoned it, of course, soon became filled with water, and though a rich deposit of copper was known to exist in the bottom, yet no persons could be found courageous enough to undertake the task of draining and re-opening so extensive a property. At length a local adventurer, who had made a lucky hit by the discovery of a rich bunch of copper in the adit level of a neighbouring mine (Kelly Bray), drowned out by water from Holmbush, determined to attempt the enterprise. He erected a 70-inch pumping-engine at the eastern shaft and commenced forking the mine Mispickel had then become valuable, and he was speedily rewarded by finding even the uppermost levels richly productive of this mineral; indeed, the difficulty seemed to be to carry away the ore, and some 30 or 40 horses were kept constantly at work for this purpose, while as the 60 fathom level was approached stones and "squats" of copper began to make their appearance whenever the mundic was taken down. Just then the big find at Kelly Bray was suddenly cut out by the intersection of a cross-course, on the other side of which the lode was utterly lost, and as the adventurer on the strength of his good fortune had invested far and wide in speculations which turned out unfortunate he was compelled to stop payment, and Holmbush was again closed. Again the machinery was all sold off, and again the mine was abandoned, even though every kibble was bringing up rich ore.

Matters remained thus until some four years ago, when Dr. Emmens, busy with the establishment of the arsenic, Nascent copper, and other chemical works in the Calstock and Callington districts, had his attention directed to Holmbush. He saw the burrows that had been ransacked and the road that had been dug up for the mundic formerly thrown away. He was told the history of the mine. He was informed by the local captains and miners of the existence of vast deposits of mundic and copper, and these accounts were confirmed by the highest authorities of the day, and ultimately he agreed to purchase and re-open the mine. Thereupon he provided an ample supply of first-class machinery, including two powerful winding-engines and an 80 in. pumping-engine, which, in accordance with the decision of a conference of mining engineers and captains convened for the purpose, was erected at the western shaft, this being the deepest and largest on the mine. Unfortunately, however, the lead lode crosses this shaft at about the 50, and owing to the mine having been so long full of water the flookan on the walls of the lode had been washed away, and large masses of the lode had fallen into the shaft, dashing the casings, dividings, and pollars into pieces, and being followed by an avalanche of killas from the country surrounding the lode. All this, mingling with the debris of the woodwork, produced an unsuspected but formidable "choke" for many fathoms in the shaft; and scarcely had the forking of the mine begun than it had to be suspended, in order that the shaft might be cleared. This operation was extremely slow, the men having to work in water up to their waists, and the whole shaft for a considerable distance having to be entirely cased with stout timber. In addition to the loss of nearly two years in time came the unexpected augmentation of expense; and, whereas the original estimate of the cost of re-opening the mine was, we are informed, about 10,000*l.*, we believe the actual expenditure incurred by Dr. Emmens has exceeded 50,000*l.* To this, we presume, must be attributed the suspension of his firm last year, which still further impeded the operations at Holmbush, though it did not compel their stoppage. At length, however, perseverance was rewarded, and in August last the 60 fm. level was reached, whereupon the mine at once sprang into a position of first-class importance and magnitude.

Already nearly 100 men are at work underground, but the existing stopes are sufficient to occupy three or four times that number, while each successive level will still further increase the reserves. So soon, too, as the 70 shall be reached (which we understand will be early in January) the cross-cut to the south lode will be rendered practicable, and the intersection of the 60 with the lead lode is now being cleared. The 500 or 600 tons of mundic and copper now produced every month should thus be soon doubled or trebled, and should be supplemented by important returns of lead and silver. Holmbush will then be worthy of its pristine fame, and its shares (for it is now registered as a joint-stock company, under the name of Holmbush, Limited) should command a correspondingly high premium. We have thought that this history of the fortunes and misfortunes of a mine might be not altogether useless as illustrating the importance of systematic work and exploration, and the necessity of patience and perseverance in those who would win riches from the bowels of the earth, and we most heartily trust that the example of Holmbush will be followed by the re-opening of other mines, and thus add to the natural resources upon which the prosperity of the country must mainly depend.

Since writing the above we have received the following report on the mine by Capt. H. Bennett, its local manager:—

"The engine-shaft is cleared 7 fms. below the 60; we are pushing on this shaft with all possible speed. The 40 is driven 73 fms. east of Wall's shaft; the lode is 2 ft. wide, worth 30*l.* per fathom; this end is opening up a good piece of ground for stoping, 20 fathoms high. We are driving as fast as possible in order to reach Bray's shaft, and when this is done we shall very considerably increase our returns.—Stoping: We have six stopes in the back of the 60, west of Wall's shaft, worked by 28 men, worth 22*l.* per fathom each on an average. No. 1 stope, in the back of the 60, east of Wall's shaft, by four men, is worth 47*l.* per fathom. No. 2 stope, in the back of the 60, east of Wall's shaft, by four men, is worth 20*l.* per fathom. Nos. 3 and 4 stopes, in the back of the 60, east of Wall's shaft (four men in each), are worth 29*l.* per fathom each. Nos. 5 and 6 stopes, in the back of the 60, east of Wall's shaft (four men in each), are worth 19*l.* per fathom each. No. 7 stope, in the back of the 60, east of Wall's shaft, by four men, is worth 32*l.* per fathom. No. 8 stope, in the back of the 60, east of Wall's shaft, by four men, is worth 21*l.* per fathom. We have five stopes in the back of the 50, at Wall's shaft, worked by 20 men, worth 23*l.* per fathom each. A stope in the bottom of the 40, west of Wall's shaft, worked by six men, is worth 16*l.* per fathom. A stope in the bottom of the 40, east of Wall's shaft, by four men, is worth 16*l.* per fathom. Nos. 1 and 2 stopes in the back of the 40, east of Wall's shaft (two men in each), are worth 17*l.* per fathom each. A stope in the back of the 35, west of Wall's shaft, by two men, is worth 14*l.* per fathom. A stope in the bottom of the 30, on the Flap Jack lode, by two men, is worth 16*l.* per fathom. The average price of stoping on the Holmbush lode is 6*l.* per unit for arsenic. We have six men cutting down Bray's shaft, which is holed to the 60, to prepare the same for a skip road, when we shall commence to clear the 60 east of shaft in order to resume the driving of this end, where the lode for the last 3 ft. driving has very much improved and is letting out a large quantity of water, being an unmistakeable proof of there being a large lode before us. I consider this a very important point going east in virgin ground, and I have no doubt we are getting near a large and productive lode. We shall also commence to clean up the same shaft below the 60, under which level it is sunk several fathoms. When this shaft is completed we shall be in a position to raise a very much larger quantity of stuff. We have commenced to clear the 60, west of engine-shaft on the Holmbush lode, where we expect to find a good lode for arsenical mundic and copper ore between the large cross-course and the lead lode. As soon as this level is cleared we shall begin to drive south on the lead lode, which lode during the last working was very rich for silver and lead. As I have already remarked, we are pushing on with the clearing up of the engine shaft with all possible speed in order to reach the 70 and 80 on the Holmbush and Flap Jack lodes. As soon as we reach the 70 we shall be in a position to stope the ground between the 40 and 70 on the Flap Jack lode, which is large and productive. In conclusion I would remark that the mine is opening up well. We have from 500 to 600 tons of arsenical mundic on the floors, in addition to keeping the Green hill Works fully supplied.

* The mine is situate near Callington in East Cornwall, at the foot of Kit Hill, a bold granitic eminence thrown up through the surrounding killas, and thus the geological position is very favourable for metallic deposits.

FOREIGN MINING AND METALLURGY.

The French coal trade exhibits a good deal of depression. It could not well be otherwise, seeing that the season is still one of exceptional mildness, that metallurgy remains in a stagnant state, and that the sugar manufacture has this year disappointed all the hopes conceived respecting it. In the Nord and the Pas-de-Calais the state of affairs is not by any means satisfactory to the coalowners. In the basin of the Loire, where metallurgical industry has exhibited more steadiness, prices have remained firm at about their former level. A canal is proposed for effecting a junction between the Aisne and the Oise; the project has received the support of several industrials in the departments interested. The exceptional mildness of the winter has exerted a rather depressing effect upon the Belgian coal trade; industrial qualities of coal have also been neglected for the moment in Belgium. The production is being reduced, but, notwithstanding this, stocks are increasing, and prices remain stationary. Supplies of rolling-stock are increasing in the basin of the Couchant de Mons, in consequence of repeated complaints which have been made upon the subject. The imports of coal into Belgium in October are officially returned at 78,000 tons, against 61,000 tons in October, 1875, and 55,000 tons in October, 1874; while the imports of coal into Belgium have been thus increasing the exports of coal from Belgium have declined.

Belgian metallurgical industry has not yet emerged from the crisis through which it has so long been passing. Matters appear, indeed, to be if anything going from bad to worse. Not only is work falling off, but prices exhibit a further downward tendency. Production is being generally reduced. The Acoz Company has even closed its Châtelineau rolling-mill until further orders; a report that a large order received by the company for rails would enable the mill to be kept going would thus seem to have been without foundation. Small firms are suffering more even from the present state of affairs than large and powerful companies, which can afford to wait at their leisure for better times. At a recent adjudication for 1400 tons of steel rails, to be delivered in the course of this month, the Cockerill Company tendered at 6*l.* 19*s.* 2*d.* per ton. For 1000 tons of rails, to be supplied to the Belgian State railways before August, 1877, the same company asked 6*l.* 18*s.* per ton; the Angleur Steel Works Company and the Sclessin Company required somewhat higher rates. Herr Krupp, of Essen, has obtained an order for 6000 tons of steel rails, to be delivered at Stargard, in Upper Silesia, at 9*l.* 6*s.* per ton; this is equivalent to 7*l.* 12*s.* 6*d.* per ton at Essen. The administration of the Belgian State railways has resolved to continue to use rails only 20 ft in length, while in France, Italy, Russia, and Spain rails of 25 or 30 feet in length are now in use. The South Italian Railway Company, it may be observed, has ordered experimentally 1000 tons of rails, 40 ft. in length. Greater stability, economy in fish-plates, and a generally superior permanent way, are the advantages claimed for long rails. Some long steel rails are now in use, with the most satisfactory results, between Liége and Namur. M. Van den Kerchove, of Ganc, has obtained an order for two engines, of 1000 horse power each, for local firms; the engines are on the Corliss system. The Lys Company has already engines of the same type in working, and they have attracted the attention of practical men, from the economic results which attend them, hence the orders just received by M. Van den Kerchove. The value of the rails exported from Belgium in the first 10 months of this year presented a falling off of 118,040*l.*, as compared with the corresponding period of 1875. A reduced tariff has just been adopted for the conveyance of iron minerals between Austria and Belgium. The Belgian Central Railway Company has completed its capital, and expects to bring its works into activity in March. It is hoped that by that month there will be some revival in business, and that the company will be enabled to profit from it. Among the appliances which the new company have introduced at its works may be mentioned a trio-differential rolling-mill, on the Lauth system. In the year ending Aug. 31, 1876, the Ougrée Collieries and Blast-Furnaces Company realised a net profit of 11,632*l.*; this balance admitted of the distribution of a dividend of 8*s.* per share, as compared with 12*s.* per share distributed for 1874-75.

The state of the French iron trade is considered to have become rather worse than otherwise during the last few days; the season of the year has, however, something to do with this. Prices have remained generally without change. The imports of Belgian iron minerals into France, which amounted in the first ten months of 1875 to 143,000 tons, declined in the first ten months of 1876 to 112,000 tons. The imports of Spanish and Algerian minerals into France increased, on the contrary, in the first ten months of this year to 461,000 tons, as compared with 439,000 tons in the corresponding period of 1875. It appears probable that Germany will not take part in the Universal Exhibition to be held at Paris in 1878. The dividend of the Pontgibaud Mines Company for 1875-6 has been fixed at 2*l.* 8*s.* per share; of this dividend 16*s.* per share has been already paid.

The Paris copper market has been rather weaker. Chilian in bars, delivered at Havre, has made 82*l.*; ditto, ordinary descriptions, 80*l.*; ditto, in ingots, 82*l.*; English tough cake, 84*l.*; English, best selected, 85*l.*; and pure Corocoro minerals, 81*l.* per ton. Upon the German copper markets transactions have been confined to the strict requirements of consumption; prices have, nevertheless, been well supported. The Rotterdam tin market has been rather weak. Since the public sale of Nov. 29 speculation appears to have abandoned the article, and several sales have been made at lower rates. The latest price for Banca is 46 fls., and for Billiton 45 fls. The Paris tin market has been inanimate, and transactions have been unimportant. Banca has made 83*l.*; Billiton, 81*l.*; and Straits, Australian, and English, 82*l.* per ton. The German tin markets have been well maintained. The Paris lead market has been tolerably firm; French lead, delivered at Paris, has brought 22*l.*; Spanish, delivered at Havre, 21*l.* 16*s.*; English, ditto, 21*l.* 16*s*: and Belgian and German, 22*l.* per ton. The German lead markets have been well maintained. Quotations for zinc have been pretty well supported at Paris. Silesian, delivered at Havre, has brought 23*l.* 8*s.* per ton. At Marseilles the quotation for Vieille Montagne zinc in sheets has been 30*l.* 8*s.* per ton. Upon the German markets there has been little passing in zinc; at the same time, prices have not varied.

Meetings of Public Companies.

DON PEDRO NORTH DEL REY.

A general meeting of shareholders was held at the Cannon-street Hotel on Wednesday,—Mr. S. LLOYD FORSTER in the chair.

The CHAIRMAN said he would enter into a few facts connected with the company. The notice which had been sent to the shareholders, dated Sept. 29 last, stated that at the general meeting held on July 4 Capt. Vivian's report was presented to the shareholders, in which it was stated that Capt. Vivian did not expect to extract paying mineral unless more favourable ore was met with, and at that meeting the directors stated that no call would be made without the approval of the shareholders. The present meeting was held to consider whether or not more money should be spent in the development of the mine, because without the approval of the shareholders the directors would not enter into any expenditure involving a call. Under date of Aug. 4 Capt. Vivian wrote that having more carefully examined the mine he could state that the mine would pay well if it were developed in depth, and recommending the erection of pumping machinery at once. It was decided at the last meeting that Captain Vivian should be instructed to extract all the paying ore he could, and to shut up the Maquine Mine, and the directors undertook to communicate with Capt. Gordon, asking him to examine the property, but up to the present time the directors had not received any report from Capt. Gordon, but he thought they might take it that Capt. Gordon agreed with the favourable opinion recently expressed by Capt. Vivian, and which opinion was circulated amongst the shareholders as soon as it was received. The directors had written to Capt. Vivian, asking him why he had materially altered his views with regard to the Maquine, and why he had not stated the reasons which had induced him to alter his views, and, in fact, asking for the very fullest information on the point. Under date Oct. 24 Captain Vivian replied, stating that in working the mine he found that the productive parts increase in thickness, that the value of the ore improved, and that the explorations in the mine tended to encourage still further operations. Within the last few days the following telegram had been received from Captain Vivian, under date of Dec. 10: "Produce for November, 6000 ozs.; sinking resumed; pumps working well." Now it might strike some shareholders as rather singular that this was the third time that favourable telegrams had been received just on the eve of a meeting of shareholders, and it might appear as if there was some collusion between the directors and the shareholders in the matter, but he need scarcely assure the shareholders that such was not the case. (Hear, hear.) This last telegram which he had just read was most satisfactory, inasmuch as the produce would leave at least 500*l.* profit for the last month, it showed that the pumping machinery was working well, and possibly what the directors proposed that the shareholders should do might be done without a call after all. He might mention that Capt. Vivian was particularly competent to undertake such work as this, and as a practical man he gave Capt. Vivian credit for the energy he had displayed in working the company's valuable mining property, and his sincerity in having the force of mind and the straightforwardness of conduct to eat his own report, as it were, and withdraw it altogether, and says he was mistaken in the first instance, as he had only been three or four weeks on the property when he made his first report. (Cheers.) He might state that the company now had at least 7000*l.* in hand without making a call upon the shareholders. (Cheers.) The directors had cut down the expenditure in every possible way, and had done everything they could to effect a saving. There was one point on which Capt. Vivian was entitled to very much credit; in all previous times since the commencement of the company the timber for timbering the mine had been purchased at a heavy cost, but Capt. Vivian had found a remedy for that. There was a certain amount of timber on the company's property surrounding the mine which was equally as well adapted for the purpose as the timber bought, and Capt. Vivian was now getting the timber from the company's own property instead of purchasing it, by which he was saving some hundreds of pounds a year. (Cheers.) The matter of most importance which he had to bring before them was the question whether, under the favourable circumstances detailed in Capt. Vivian report, and corroborated by other mining captains, the shareholders were disposed to expend some further amount in developing the mine in depth, and erecting permanent pumping machinery. He (the Chairman) was himself of the opinion that if this were done they would be able, he would not say to pay again the 100 per cent. which they paid in former times (which high dividends, by-the-bye, were assisted by the favourable rate of exchange then ruling), but he was of opinion that the shareholders would at any rate reap a fair reward for their perseverance in prosecuting the mine in depth. He was also strongly of opinion that this would involve no call, as there was now 7000*l.* to the good instead of 4500*l.* He could assure the meeting, as Chairman of the company, that as long as he and his coadjutors remained on the board he would undertake that if it were possible to avoid a call no call would be made, and he thought it was not only highly possible, but probable, they would be able to avoid a call. The resolution which he had to move was as follows:—"That in the opinion of this meeting, based upon the views recently expressed by Capt. Vivian and other mining captains, and which has been circulated amongst the proprietors, it is desirable to prosecute the mine in depth, and that the directors are hereby directed to take such steps as may be necessary for carrying the same into effect." He might mention that all the information the directors had received had been sent to the shareholders. The real question to be considered to-day was very simple—namely, whether the recent reports received from the mine were sufficient to induce the proprietors to instruct the directors to expend further money in developing the mine in depth and erecting permanent pumping machinery? For his own part he was distinctly of opinion that this should be done, and he should be glad to hear an expression of opinion from the shareholders.

Mr. HILL said it was satisfactory to know that there was some gleam of hope and that there were signs of vitality in the mine. After the unfavourable report at the last meeting the shareholders were scarcely prepared for the recent favourable report of Capt. Vivian as to the apparent capabilities of the mine, and his chief aim in rising was to enquire with respect to the probable expenses to be incurred in sinking in depth and erecting new machinery? They knew that enormous sums had been spent in the past, but it was no use reviving that part of the question; but, if he remembered rightly, at the meeting which was held in July two or three different opinions were given—15,000*l.*, he thought, was the extreme limit, and the sum of 5500*l.* was also mentioned by Capt. Vivian; but up to the present time the shareholders were uncertain as to what the probable expenses would be. Whilst he recommended fully the adoption of measures of prudence in a case of this sort, still they ought not to rush into any uncertain expenditure; at the same time if the mine was a good one it deserved to be prosecuted in depth, and that could not be done by any "bit by bit" measures, and if anything like an extensive outlay were necessary let the shareholders discuss it, and know as nearly as possible how much they would be called upon to expend. From the tenor of the last telegram he assumed that sinking had been resumed. It would be interesting to know what was the power applicable for sinking, and whether Dawson's wheel had been put into such a state of repair as to be available for the further prosecution of the mine in depth, or whether some further machinery had been used, though not of a nature equal to the permanent pumping of the mine. Captain Vivian had certainly made an extraordinary jump from one set of opinions to another. No doubt Capt. Vivian might have right on his side, and the opinion which he hazarded at first might have been immature, and subsequent experience may have corrected it. He would ask whether this resolution, if passed, would give the directors power to make a call? He thought the shareholders should have a very clear indication of what the intentions of the board were on that point. He seconded the resolution moved by the Chairman.

Mr. RANSFORD asked on what terms Capt. Vivian was sent out, and what was his present position? Was he mining captain or superintendent? He also asked what had become of the pumping machinery which had been made at Hayle, and sent to the mines? Had that ever been erected, and was it doing effective work? He did not see that Capt. Vivian had proved the necessity of carrying down further sinking, or having further pumping power. Would it not be better to send out an expert—someone accustomed to gold mining in Australia? The amount of 15,000*l.* was large, and he was afraid that if this resolution were passed it meant that there would be a call to the extent of 15,000*l.* (No, no.)

A SHAREHOLDER: Did Capt. Gordon say that a call would be required to sink, or could we sink without a call?——The CHAIRMAN: He has not been asked. We asked him to make a report, but up to the present we have not received a report, but I have no doubt he agrees with Capt. Vivian.

Mr. HILL: Is it supposed that the lower sinkings will be in the jacotings formation?——The CHAIRMAN: Yes; in the jacotings.

Mr. T. G. TAYLOR said he was not averse to proceeding with the operations at the mine, but he should like some better explanation why Captain Vivian has so quickly changed his opinion. He expressed his opinion that in previous years the best of the gold at the mine had been plundered, and expressed a hope that a close

supervision would be exercised to see that all the gold found its way to the pockets of the shareholders.

Mr. ATTRILL thought that before passing the resolution the shareholders should wait for some further report from Capt. Vivian. He thought the shareholders ought not to sanction a call at the present time: let them go on working with 7000*l.* and the earnings of the mine, then, if a call were necessary, let the shareholders be called together, and their sanction obtained.

The CHAIRMAN said that the object of the present meeting was to obtain an expression of opinion from the shareholders as to whether any portion of the 7000*l.* now available should be used for the purpose of developing the mine in depth. He would give a pledge that as long as he was chairman no call would be made without a meeting of shareholders being convened and their sanction obtained. As chairman of the company he would not involve the shareholders in any expenditure without previously obtaining their sanction. (Hear, hear.) In reply to Mr. Taylor, he would say that the directors in sending out Captain Vivian had taken care to select the best man they could possibly find. The reason why Capt. Vivian changed his opinion was fully explained in his last letter and in the telegram. After having been out three weeks Capt. Vivian had found a lode in that part of the mine which had been shut up, and he gave Capt. Vivian great credit for having had the frankness to confess that he had formed a wrong estimate. As regarded the probable expense, 5600*l.* was not the amount which himself and Mr. Dawson had estimated as the probable amount, but on that point he would reiterate what he had already said—as long as he was chairman no call should be made without the shareholders being called together, and their sanction previously obtained. At present Dawson's wheel was doing the work of permanent pumping machinery. The permanent pumping machinery had not yet been set to work, and to do this would involve expense and time. The heavy rains had enabled Dawson's wheel to do more work than before. The directors did not feel disposed to go to the expense of setting up and putting to work the permanent pumping machinery without the consent of the shareholders, and it was to obtain that consent, or otherwise, that the present meeting was called. As regarded sending out an expert, it was unnecessary, because, as a matter of fact, Capt. Vivian was an expert, and the shareholders might rely upon his report. As regarded the pumping machinery made at Hayle, it was at the mine, but it would require some expense and time—about seven months—to get it up and at work. The directors hoped before long to receive a report from Capt. Gordon, and the shareholders would be made acquainted with the nature of that report. He acknowledged the readiness with which Mr. Hoekin, the chairman of the St. John del Rey, had consented to Capt. Gordon inspecting the Don Pedro Mine. He would ask Mr. Dawson, the managing director, who had visited the property, to say a few words to the meeting.

Mr. J. E. DAWSON, managing director, said that when Capt. Vivian said that it would cost 5500*l.* to erect the permanent pumping machinery he was not taking into consideration the expenses that would be necessary to enlarge the inclined shaft, and also to drive the cross-cut from the shaft to the lode, and when he himself ventured an opinion at the last meeting that 20,000*l.* might be nearer the mark, he was allowing for the expenditure which would be necessary during the construction of the permanent pumping machinery, such as keeping the mine open and working it, but they must bear in mind that although Capt. Vivian had said that 15,000*l.* might (not would) be required, still if these three discoveries turned out of any moment—and there seemed a fair prospect that they would—nothing like 15,000*l.* would be required. (Hear, hear.)

A SHAREHOLDER: The machinery would not be wanted.

Mr. DAWSON: Yes, it would be wanted. The three discoveries would not make a mine; they might pay the expenses of opening up more ground and sinking. He would make one or two remarks with regard to Capt. Vivian's report. There seemed to be no doubt about this fact, that the increased pumping machinery must be supplied. Capt. Vivian in his letter of August 4 stated: "I strongly recommend the erection of permanent pumping machinery at once." That alluded to the machinery which was now on the mine. On August 24 Capt. Vivian wrote: "I am perfectly satisfied any other arrangement will be a waste of money and time; no patching up of Dawson's wheel." He might state that Dawson's wheel was now strained to the utmost, and the reason that Capt. Vivian was able to sink was that the wet season had set in and the wheel was being driven faster, but of course doing harm to the wheel by driving it so fast. Assuming the pumping machinery had to be erected, how was the necessary outlay to be met, and what was there to justify it? As regarded Captain Vivian's change of mind it was not extraordinary; knowing the state in which the hands were at the mine when Capt. Vivian got out, he himself was not at all surprised that Capt. Vivian formed an unfavourable opinion of the property. But he knew for a fact that as soon as he had written his report, knowing that a period must elapse before the directors' instructions could be received, Capt. Vivian said to the mining captains, "Let us see if we can find anything, as we must work the mine for a certain time until we get an answer;" and, as the Chairman had said, the greatest credit was due to Captain Vivian for the energy and ability which he had displayed. (Hear, hear.) Captain Vivian wrote that he had made three discoveries. There was one fact which it would be well to mention, and that was with regard to the lode called the "Curve." In the reports of bygone years that lode had been referred to as the one which had enabled a dividend of 100 per cent. to be paid, and it was discovered by an exploratory rise which was put up from Alice's level; he should be sorry for the shareholders to believe that the present exploratory level was going to lead to the same results, but at the same time they could not tell in a jacotinga formation what they were coming across, and Capt. Vivian said it was a large, compact, and well defined lode, from which splendid samples had been taken. This was somewhat modified by the telegrams of Nov. 8 and 19; still the report of Capt. Vivian was written expressing a favourable opinion, and showing the discovery in the exploration above Alice's level had improved, therefore it might be taken that the telegram of the 17th of November, that Alice's level did not look so well, simply took the discovery back to the point that it was still a large, compact, and well-defined lode. He was somewhat sorry that Capt. Vivian had attached so much importance to the raising of 20,000 oitavas between June and September. It was true that that amount had been raised, but it was no indication of any material improvement of the lode in depth, and for this reason, that out of 20,000 oitavas raised about 2000 did not come out of the mine, but were obtained from washing the bed of the gully, in which a quantity of waste sand from former workings had been deposited, leaving 18,000 oits. as having been obtained from the mine, and out of these 18,000 a considerable proportion was derived from pillars of lode which had been left about 60 fms. on the incline above the bottom of the mine, high and dry. That the mine ought to be sunk further he had not the slightest doubt, because in the jacotinga formation they never knew what they were coming to, but there were three or four reasons why he urged the shareholders to go on with the work. It was very clear that some improvement had manifested itself in depth, and then came the question of Capt. Vivian's three discoveries above the water level, one of which discoveries, Captain Vivian stated, would give large quantities of paying mineral. The second discovery was very promising, although Capt. Vivian did not promise any gold from it. From the third discovery boxwork samples had been taken, and in his opinion that would probably be the most important discovery of all. That discovery had been made at a point 20 or 25 fms. from the bottom of the mine, much deeper than the other two discoveries. For some years past No. 6 lode has been making a turn to the north. The discovery which Capt. Vivian now reports in No. 6 has been made in putting up an exploratory rise above the 25 fm. level to test the ground to the south of the lode, to see whether the contortion is natural, or whether the lode continues its regular course, and Captain Vivian says he has found boxwork samples at a spot which is outside what has hitherto been supposed to be the south wall of the lode. If that be correct it may not be possible to over-rate the importance of the discovery. Of course, it may prove but an offshoot from the lode, but on the other hand it may be found that the lowest works have hitherto embraced only a portion of the lode. Dawson's wheel was now strained to the uttermost, and very little can be done without permanent pumping machinery, and he should certainly recommend the shareholders to authorise the erection of the machinery. (Cheers.)

The CHAIRMAN, in answer to a question, said that the machinery which was at the mine, but which had not been erected, had been taken the greatest care of, and had not been allowed to deteriorate in any way. As regarded the erection of permanent pumping machinery, the directors had received 36,900 shares in favour of it, 5800 indefinite (thus leaving it to the directors), and only 1400 against it.

The resolution was then put and carried unanimously.

By a show of hands it was then unanimously decided to continue the issue of the monthly reports.

A cordial vote of thanks was then passed to Capt. Vivian for the energy and ability with which he had managed the mine, and a vote of thanks having been passed to the Chairman for his able and courteous conduct in the chair the meeting broke up.

THE ALMADA AND TIRITO CONSOLIDATED SILVER MINING COMPANY.

The thirteenth half-yearly general meeting of shareholders was held at the offices of the company, Finsbury Circus, yesterday, Mr. PHILLIP F. NEEDHAM in the chair.

Mr. H. G. DENNISS (the secretary) read the notice calling the meeting and the report of the directors:—

The directors regret to have to report a loss on the half-year's working of 7760*l.* 7s. 3d. The total amount to the credit of profit and loss at the same period, after writing off 647*l.* 8s. 6d. for depreciation of machinery and construction, is 16,524*l.* 12s. 11d., which exists, as shown by the balance-sheet, in stores, ores in course of reduction, and in stock at the mines, and those at Agiabampo and Mazatlan, and *en route* for England.

The same cause which operated unfavourably on the result of the working up to Dec. 31, 1875, has continued during the half-year ending June 30, 1876—the low ley of the ores. The decreased value of silver during the half-year has also added to the loss. In addition, however, to these causes the directors would refer to Mr. Breach's report, relative to the Mina Grande at the 12 fm. level below tunnel, as also contributing to the above unsatisfactory results. The lode at the 12 fm. level, and for 35 ft. above, seems to have been disordered by hard silicious felspathic rock, which has acted very unfavourably for the production of ore. There is still ore under the tunnel level, but at present no estimate can be formed of its value, as it has hardly as yet been touched, Mr. Breach considering that it would be best worked from below. Unfortunately, the ore from this mine, as hitherto treated, seems to be poor in silver (about 20 ozs. to the ton), and has too large a proportion of lead and zinc to be profitably worked at present. The Balvanera shaft is now sunk to the 24 fm. level below tunnel, and the directors hope that the shoot of ore at the 12 fm. level (about 30 ft. long and 8 ft. wide) will continue to make in depth, and improve in quantity and quality.

Mr. Breach's half-yearly report, and the mining intelligence already sent round to the shareholders, which comes up to nearly the end of October, have already so fully described the actual position and future prospects of the mines, that the directors do not think it necessary to say anything in addition beyond this—that the telegram received from Mr. Breach on Nov. 13, informing them of the discovery of what appears to be a valuable lode under the 42 in the Tirito Mine, is the best feature they have to record, and it is at this point, and in the Dios Padre Mine, where hopes for the future at present rest.

The low price of silver ruling during the past nine months, especially up to the end of June last, has caused a very serious depreciation in the values of the ores as estimated by Mr. Breach, as will be at once seen by an inspection of the accounts. As the price is now 54½*d.* per oz., the directors trust that the worst is over in this respect. The ships now bringing over ores are the Southern Chief with 60 tons, and the Patagonia with about 300 tons. The last of these vessels was at Mazatlan in October, and was to load the above ores early in November. Several lots have recently arrived at Swansea, including the Courrier with 76 tons, the Colima 94 tons, and Granada (No. 2) 74 tons. These have been sold and will, it is believed, realise Mr. Breach's estimates. About 31 tons by the Moselle have since arrived at Southampton. The main objects the directors have in view at the present moment are the sinking of the Tirito shaft to the 52, where the ground is porphyritic and favourable for the production of ore, the opening up of the bunch of ore at the 24 fm. level in Mina Grande, and the sinking of the Dios Padre shaft, and communicating same with the tunnel level in that mine. The greatest economy is being exercised both at the mines and in London.

The directors do not disguise from themselves the fact that in the absence of fresh discoveries of ore, the deposits now being worked cannot be expected to more than meet the working expenses for the next few months, but they entertain hopes that the explorations being made in the Tirito and Dios Padre Mines will result satisfactorily. In the meantime the shareholders will be kept, as hitherto, fully informed of the progress of affairs at the mines.

The CHAIRMAN said it was with regret that the directors were not able to come before the shareholders on this occasion with a more favourable report as to the position of the mine. The loss shown by the report was 7760*l.* 7s. 3d. for the half-year ending June 30 last, and for the months which had elapsed since the directors calculated that about 5000*l.* more had been lost, in consequence principally of the poor ley of the ores in the Mina Grande, which were found upon working to contain much more zinc and lead than they did in the higher workings. The directors had also been disappointed in the discoveries made in the Virgin lode, which had not turned out so well as the board had been led to expect. As soon as the directors found that the telegrams from the mine conveyed a loss month after month, they sent out orders instructing the manager by cable to reduce the expenditure to the utmost; and in view of the unsatisfactory ley of the ore in the Mina Grande, the manager had also received instructions (which he had acknowledged) to direct his immediate attantention to the exploration of the Tirito shaft, under the 42 fathom level, and the exploration of the Dios Padre Mine. The directors had that morning received a batch of letters from the manager, which had not hitherto been sent out to the shareholders. In one letter, dated Oct. 19, occurred the following passage:—"I to-day forward telegram, which should read as follow: Lode under the 42 3 ft. wide, unselected docile ore, worth 100 ozs. per ton; preparing to sink Tirito shaft." Since then, as he had stated, the directors had received letters that very morning, in which the manager stated:—"We have sunk 12 ft. on the ore in the 42, and last week were obliged to stop on account of water, because to sink a winze only a few feet under the 42 fm. level would be, if carried deeper, a useless expenditure, that had much better be laid out in the shaft itself. Before leaving the winze I had ore broken all over the bottom, that is a fair sample of the lode as we left it, and without any selection the ore was broken up, a fair sample taken and assayed, giving $124 per ton. It is green ore, very docile, and with a great porportion of rich pitanque. The ore is 3 ft. wide, and had it been cleaned in the ordinary manner would doubtless have given $150 per ton." That was the latest information with regard to this most important point in the mine, as regarded the other point to which the attention of the directors had been directed—the exploration of the Dios Padre—the following passage occurred in a letter received this morning under date November 3:—"In the Dios Padre tunnel end a vein of ore 9 in. wide, and very hard and solid, was cut last night. It is composed of pitanque, lead, and green ore, and appears very rich." That was the latest information which had been received from the mine. As regarded finances, the directors had done everything they possibly could to reduce the expenditure, and economise in every possible way; and Mr. Breach had had stringent instructions to cut down expenses in every possible way. In addition, he might mention that the directors, finding that the mine was not at present paying dividends, had passed a resolution foregoing half their remuneration until such time as the mine was in a position to pay a dividend, and he hoped the shareholders would accept that as a proof of the desire of the board to economise in every possible way. The directors had given the whole matter of the working and management of the mine their most careful consideration, and he could only regret that it was not in the power of the board to lay a more favourable report before the shareholders; but he hoped that the explorations now being carried out would lead to an improvement in the position of the company. In conclusion, the chairman moved the adoption of the report and accounts.

Mr. KERSHAW seconded the motion. He regretted that the report on the state of the mine was not of a more satisfactory character. He thought the action of the directors in voluntarily reducing their fees, without even a hint from the shareholders, was much to be admired, as it was certainly an evidence of their desire to reduce the expenses as much as possible. The printing and despatching of the reports and telegrams was probably an expensive matter if they are sent to each of the shareholders.

The CHAIRMAN: We send them to each shareholder.

Mr. KERSHAW thought it very probable that the majority of the shareholders would understand very little about the mine even by sending the despatches, and he thought the expense of sending out this information might be saved.

Mr. MORGAN said the expense of this work was about 30*l.* per annum.

Mr. KERSHAW said that in St. John del Rey Mine the information received periodically from Mexico is only sent to such shareholders who desire that advices shall be sent to them, and the same course might be pursued in this company if any saving would be effected thereby.

Mr. WYLD thought that as the expense was so small as 30*l.* per annum the advices should be sent to each shareholder. He wished to know how the company stood with regard to its finances, as this was a matter of considerable importance. He wished to know where the funds were to come from to carry on the mine, for although a large balance was shown in the accounts the greater part was probably locked-up. There was an item of 32,000*l.* for silver ore, but of this sum the 6317*l.* for ore in Mexico must be considered a lock-up for the present.

The CHAIRMAN remarked that the 32,000*l.* referred to had been received since the accounts were made up.

Mr. WYLD said he was speaking for the accounts, and the 6317*l.* was in all probability a lock-up for some time to come.

The CHAIRMAN replied that the company had sufficient funds in hand at the present time to carry it on to the end of January to begin with. But beyond that they had *in transitu*, by the South Carolina, which had arrived at Swansea, ore of the estimated value of 840*l.*, and by the Colima, which had also arrived at Swansea, ore of the estimated value of 720*l.*, and these estimates were based on lower calculations for the price of silver than were now ruling, probably at about 54*d.* or 55*d.* an ounce, perhaps lower. During the past eight months silver had fluctuated from 46*d.* to 53*d.* per ounce, so that no very accurate estimate could be made. Besides the two shipments referred to, they had *en route*, by the Southern Chief, by Cape Horn, ores estimated to produce 1300*l.*, and by the Patagonia about 900*l.* worth. These items together represented an estimated value of 3760*l.*; but he thought, considering the rise in silver since the estimates were made, that they might calculate upon 4000*l.* with safety. The Patagonia was due in April, which would give an additional amount of 4800*l.*, and Mr. Breach had written that he would not require to draw upon the company in London for the next six months. In his telegram he strongly recommended that all their resources should be devoted to the prosecution of the workings in the Tirito and Dios Padre Mines, especially in the sinking of the Tirito shaft and driving the tunnel. The company would have during the next six months about 8000*l.* With respect to drawing against shipments, the diminution of the docile ore rendered it necessary for Mr. Breach to draw upon the company's agents in London for the requirements of the mine for current expenses. That had now been stopped, and Mr. Breach had been told that when he raises black ores he is at liberty to draw against the company for the value of the black ores, and he (the Chairman), therefore, believed that Mr. Breach had not drawn against the ores which would arrive by the Patagonia.

Mr. WYLD: Then, in fact, you see your way clear for the next six months?

The CHAIRMAN: Yes; and certainly, I hope, a little further. The directors were looking ahead, and would be very careful to make the best of the means at their disposal.

Mr. WYLD asked if, supposing the operations were confined to the Tirito and Dios Padre Mines, the shareholders would, probably, have a fair return for their money?—The CHAIRMAN replied in the affirmative.

Mr. SWAFFIELD, after expressing his regret at the unsatisfactory nature of the operations at the mine, said as auditor of the company he had drawn out a short statement of their financial position. From this he found that on June 30 last the total indebtedness of the company was 35,276*l.* 1s. 9d., and the total amount of available assets was then 40,629*l.* 7s. 2d., exclusive of stores. Against this there was an estimated loss of 5000*l.*, and probably something on capital account, which would increase the amount to 6000*l.*; and, in addition to this, there were some of the debentures due for payment in the summer. He thought Mr. Breach had been unfortunate in his prognostications, and he had been discouraged by the intelligence that instructions had been sent out to confine operations to two points. He considered it advisable that the expenditure should be cut down everywhere before cutting it down in the development of the mines. Then they had been informed that there was a lode 3 ft. wide, and worth over 100 ozs. of silver per ton, but no subsequent information on this matter had been received.

Mr. MORGAN explained that Mr. Breach could not send any further information until the shaft could be sunk down another 10 fms., as he had got down to the water.

The CHAIRMAN said the reason why instructions had been sent to Mr. Breach to confine his attention to the Tirito and Dios Padre Mines was because that course was strongly recommended by Mr. Breach. As the directors had confidence in their manager they considered it advisable that his recommendation should be carried into effect more especially as he had given such good hopes of a favourable out-turn at Tirito. Although he was not a miner himself, Mr. Morgan, the London manager, was in constant communication with persons of great experience in mining, and has frequent interviews with Mr. Petherick, who knows the mine well. Besides this, Mr. Breach is in constant communication with Mr. Clemes, the former manager, and Mr. Clemes had strongly recommended to pursue the Tirito workings south of the slide. Mr. Preach could not be held responsible for the falling off of the docile ores. He had had bad luck, and that was the cause, not bad management. Mr. Breach had always shown the greatest energy and desire to produce satisfactory results, and he thought him a competent and a hard-working man.

Mr. CROKE asked whether Capt. Clemes approved of what Mr. Breach had been doing, because he considered Capt. Clemes a most competent miner, and he would be quite prepared to trust to his judgment.

The CHAIRMAN replied that Capt. Clemes and their present manager were entirely agreed as to the development of the mines. Mr. Clemes left the company because he had a much better offer, and it was at his recommendation principally that Mr. Breach was appointed.

A SHAREHOLDER suggested that Mr. Clemes should be invited to visit the mine, and report upon its present position and prospects, and the CHAIRMAN promised that the suggestion should be carried into effect.

Mr. MORGAN said information had just been received stating that Mr. Breach had heard from Mr. Clemes quite recently; and with regard to the effect of the slide towards the south end of the Tirito Mine, Mr. Clemes has entirely changed his opinion, and he now considers that the effect of the slide will cease east of the present workings, and that the lode will be found, in all probability, considerably south of anything that had been seen at present, and in his recommendation to explore in a south direction he said he would, if necessary, recommend the outlay of even so large a sum as 20,000*l.* to develope it, so important does he consider that part of the mines. It should be remembered that even after confining operations to the Tirito and Dios Padre Mines there would be an immense amount of work in hand, as the workings were of a very extensive character.

Mr. WYLD asked how long it would take to sink the shaft the required depth?

Mr. MORGAN replied that it would take about three months from the present time.—The reports and accounts were then adopted.

On the motion of Mr. KERSHAW, seconded by Mr. CROKE, a vote of thanks to, and confidence in, the Chairman, directors, and Mr. Breach was unanimously passed, and the proceedings then terminated.

LITTLEDEAN WOODSIDE COAL COMPANY.

The half-yearly general meeting of shareholders was held at the Town Hall, Cinderford, on Dec. 6, when, in the absence of Mr. Edwin Crawshay, the managing director, through illness, which was much regretted by all present, Mr. ALFRED RIDLER presided. The SECRETARY having read the notice convening the meeting, and the minutes of the last being confirmed, the Chairman submitted the statement of accounts, which, with the proceedings of the directors, were approved of and carried unanimously. The usual vote of thanks concluded the proceedings.—The report stated that—

The directors are pleased to inform the shareholders that since the last meeting the seam of coal in the deep level has been won, and proved of excellent quality, averaging 4 ft. in thickness. Roads have been driven north and south in the vein 80 and 60 yards respectively; the coal is being opened out, and in a few weeks they will be in a position to materially increase the output. Taking into consideration the bad state of trade in the country, and the dead expenses necessarily incurred in developing the property, the shareholders must consider the position satisfactory. The works having been brought to their present state, and the dead work nearly at an end, the further prospects of the company are most encouraging. In conclusion, the directors can only add they have every confidence in the concern, and would again advise the shareholders not to part with their interest in it.

CO-OPERATIVE COAL MINING.

A special meeting of the shareholders of the Leeds and Yorkshire Co-operative Coal Mining Company (Limited) was held, on Tuesday, in the Albert Hall, Leeds, Alderman TATHAM presiding. The following special report of the directors as to the Lofthouse Station Colliery was read:—

On Nov. 20, 1876, exactly three years to the day since the first sod was cut, the Silkstone seam was reached by boring 9 yards from the bottom of the sinking in B shaft, the depth from the surface to the bottom of the seam being 362½ yards. As far as could be judged at the time, the seam was 4 ft. 9 in. thick, and of good quality. Since then it has been proved by sinking, and our engineer reports the section to be as under:—Top coal, 2 ft. 6 in.; dirt, 1 in.; bottom coal, 1 ft. 7 in.; Wetstone coal, 6 in.: total, 4 ft. 8 in. Under the Wetstone there is 6 in. of spavin, and then 6 in. of coal with spavin under the coal. Until this seam has been explored a little, and its precise character, &c., determined, it may be premature to make any definite estimate, but the directors are sanguine, from present appearances, that there is all reasonable prospect of early and considerable dividends for the shareholders. The capital called up is 4*l.* per share on 13,347 shares—53,388*l.* A further sum of about 23,000*l.* will suffice to make the colliery, during next year, equal to an output of 300 tons a day. This ought to enable the company to pay, after the end of 1877, a satisfactory dividend. A further moderate outlay will readily increase the output to 800, 1000, or 1200 tons per day, yielding a proportionately increased dividend. There remain unallotted 6653 shares, and if the present shareholders incline to take these up they will have the advantage of retaining the whole interest of the undertaking entirely in their own hands; and the directors, in accordance with the understanding entered into some time ago with the shareholders, propose to offer them these shares, and in such a way that they can, without its being burdensome, secure to themselves the full benefit of the concern. They propose to offer to the present proprietors one share for every two which they now hold, being 6653 shares. On these 10s. per share will be payable on application (3326*l.* 10s.), 10s. on allotment (3326*l.* 10s.), and 10s at intervals of not less than two months until 4*l.* per share is paid up. Thus making the amount on these 26,612*l.*, and with those already issued, together, 80,000*l.* or 20,000 shares, 4*l.* paid on each, and leaving 1*l.* per share—20,000*l.*—to be called up afterwards on the whole 20,000 shares, as it may be required for the further opening out and development of the colliery. Should this proposal be confirmed by the meeting, the directors will at once proceed to issue forms of application for shares, indicating the number to which each shareholder is entitled, which may be filled up for the number indicated, or for a larger or smaller number as each one may prefer. Should the applications exceed the number to be allotted, and no allotment be made, the deposit money will be returned without reduction. Should the applications fall short of the number of shares to be issued—a time being fixed when no more will be received—the directors will feel themselves at liberty to dispose of them in such a way as they may determine. Any shareholder may, if he thinks fit, pay up to the extent of 4*l.* per share, any of the above 6653 shares which he may take, and on the same the directors will allow interest at the rate of 5 per cent. per annum for the anticipated payment. The directors propose to issue scrip for the shares on which 4*l.* has been called up and paid.

The CHAIRMAN, in opening the meeting, described the progress made, and illustrated it by means of diagrams. He expressed regret at the accident which had recently occurred at the mine. Noticing the financial condition of the company, he said that if they were able to raise 300 tons a-day that would be 90,000 tons a-year, and were they to realise 10¾*d.* per ton, it would equal a profit of 5 per cent. A resolution was adopted, approving of the special report which had been presented, and requesting the directors to carry out the proposals contained therein. Votes of thanks were given to the Chairman and the directors.

For remainder of Meetings see to-day's Journal.]

POST OFFICE LONDON DIRECTORY.—Again we have to announce a new annual edition—the seventy-eighth—of Messrs. Kelly's great work—the Post Office London Directory, but as it is about the fortieth time which we have ourselves drawn attention to its merits it is a little difficult to find points which have not already been noticed. The great value of all works of this character is to be estimated by its accuracy, and in this respect the Post Office London Directory is beyond question unsurpassed. From the enormous facilities for printing and publishing which the firm possesses they are enabled to keep every page open for correction to the latest moment, and that these facilities are utilised will be evident to all when it is stated that alterations which occurred so late as Dec. 1—for example the gazetting of Lord Blackburn, Sir H. C. Montgomery, Bart., Sir G. W. Bramwell, Sir W. B. Brett, and Sir R. P. Amphlett as Privy Councillors is correctly recorded in the proper places throughout the volume, and there are many other corrections equally late showing that not a page could have been printed before that date, yet on Dec. 9 we received the volume complete—3013 pages—beautifully printed, and elegantly and substantially bound. As a further test of accuracy and revision to date of publication, it may be mentioned that Lord Airey's name and title is properly inserted throughout, the death of Mr. George Moore (Copestake, Moore, and Co.) is noticed by the removal of his name from various places in which it occurred—the list of Lieutenancy of London, City Directory, Official Index, Court Directory, &c. The new member for Frome—Mr. H. B. Samuelson—is correctly entered as such both in the Parliamentary and Court Directories, and the names of the members of the New School Board, only elected on Nov. 30, are fully given, whilst the names of the late Chief Justice Whiteside and the Duke of Saldanha have been removed from wherever they occurred. The Post Office London Directory is altogether one of the best arranged and most carefully corrected volumes published—its reputation for reliability being deservedly high throughout the kingdom—and the City man who can dispense with so necessary a 40s. worth must indeed have very little business to attend to.

POCKET BOOK OF COMPOUND ENGINES.—The number of works and memoirs on practical engineering published by Mr. N. P. BURGH has been very great, and he has now issued a very handy little "Pocket Book on Compound Engines." He remarks that the want of such a book has been so apparent that the query is—why has it not been done before? But he explains that if the leading firms had not put their experience so fully into his hands he could not have done it now. The formulæ introduced are for the main portion new, but at the same time founded on results absent from dispute, so that the future engine can be safely designed from them without doubt of the present result, and it may be with improved economy. Mr. Burgh explains that the action of the steam in compound engines, relative positions of the cylinders, how to design a compound engine, an analysis of the indicotor diagram; formulæ to obtain the value of the unit of heat, and the loss of heat in the steam in compound engines cylinders, and various other useful facts. The pocket book appears to have been prepared with much care and judgment, and will doubtless enjoy an extensive circulation.

LETTS'S DIARIES.—The number of separate forms in which these diaries are published is so large that one or other must be suited to the wants of every reader; for example, the No. 39 Rough Diary or Scribbling Journal, a moderately thick volume foolscap size, the diary showing a week at an opening, and interleaved with blotting, is well adapted to the requirements of the tradesman's desk; whilst No. 34, a quarto of the same class, a week on a page, will satisfy those with smaller business, or who are in the habit of making their entries more neatly. The Improved Clerical Tablet Diary gives each week on a separate sheet large note size, with proper lessons and psalms for every day in the year, with notes on matters interesting to the clergy; as each week passes the record of it can be detached for storing away or turned over on the suspension loop to keep the whole together to the end of the year. No. 10 is a compact little 8vo., neatly bound in cloth, and suitable for the merchants' desk, and many of the smaller sizes are sure to be put to some use by men of the same class. No. 28 is a convenient sized vest pocket diary, whilst Nos. 20 and 22 are larger volumes of the same class. The Card-Case almanack corresponds in size with a gentleman's card case, and the Memo. Calendar is only as thick as a dozen cards, and nearly as small as that just mentioned. The whole

of the diaries are well printed and arranged, and thoroughly adapted to the uses for which they are intended.

THE SILVER QUESTION.—An exhaustive review of the Silver Question embodying a suggestion "How to Raise the Exchange" has just been published at Simla (London: Longmans) by Mr. D. P. STUART-MENTETH, stock and share broker, of Calcutta. Although the alteration in the aspect of the silver market has done much to modify views which would a short time since have appeared quite justifiable and worthy of adoption, there is much in Mr. Stuart-Menteth's book which will well repay perusal. He carefully reviews the causes which have led to depreciation in the value of the rupee as a standard of currency in connection with the exchange between India and Great Britain, and suggests a remedy which consists in the conversion of the Indian public debts into a Rupee loan, the greater part of which would be taken in India, and render unnecessary the selling of Indian Government bills in London to cover India's indebtedness to English creditors. The whole subject has evidently been well considered by Mr. Stuart-Menteth, and his suggestions are well worthy the attention of those interested in Indian finance.

HIGH-PRESSURE EXPANSIVE SIX-CYLINDER ENGINE.

Fig. 1.

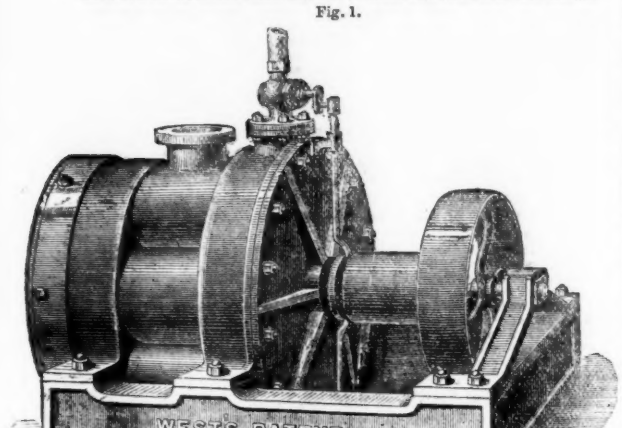


Fig. 2.

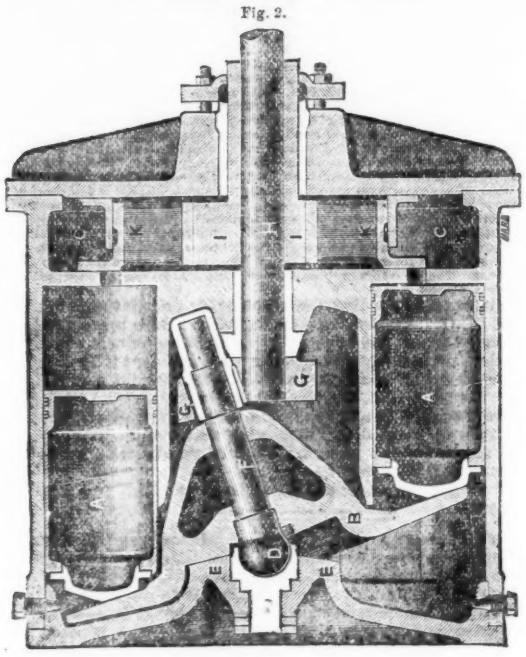
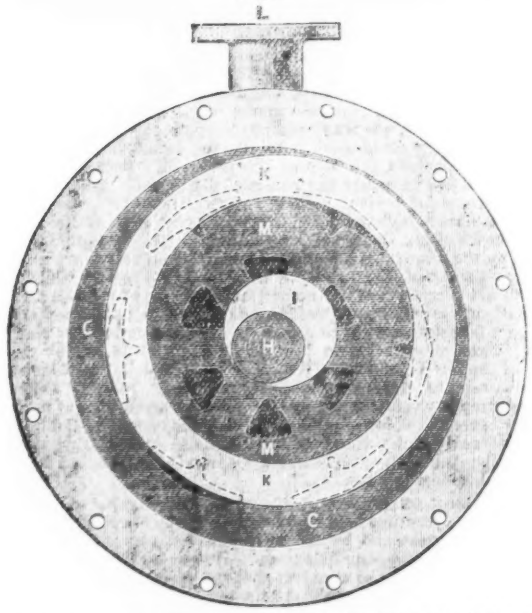


Fig. 3.



Amongst the more attractive exhibits at the Smithfield Club Show was West's Patent High-Pressure Expansive Six-Cylinder Steam-Engine, exhibited by Messrs. PLAMBECK and DARKIN, of Queen Victoria-street. It consists of six cylinders arranged in a circle around the driving shaft. By means of an annular valve of very simple construction, which is carried by an eccentric working in the steam chest on the shaft, steam is admitted to these cylinders in rotation, thus causing the pistons to press successively on the flat surface of a conical disc, and imparting a rolling motion to it without revolution on its axis. The back centre of the disc is supported by a ball and socket joint, and a pin passing through the disc fits loosely into a crank on the shaft, and as this pin, owing to the rolling motion of the disc, describes a circle around the shaft it communicates a rotating motion to it. The engine is suitable for driving all kinds of machinery, and offers great advantages where high speed and small space are desirable. The arrangement of the engine will be more thoroughly understood from the subjoined details.

Fig. 1 shows the outward appearance of the engine for general purposes. It is fitted with a spring governor enclosed in a hollow drum on the driving shaft. As this drum moves to and fro in consequence of any variations in the speed of the shaft, it actuates the throttle valve by means of a lever, as shown. The engine can, however, be fitted with any other good high speed governor, if desired. Figs. 2 and 3 show the interior arrangement, and it will be seen that the main body of the engine consists of one casting containing six cylinders arranged in a circle, and parallel with one another, like the chambers of a revolver. Fig. 2 is a horizontal longitudinal section of the engine. The pistons (A) are of the form of a solid ram or plunger, one end terminating in a blunt cone, which bears continuously against the periphery of the conical disc (B). The pistons are single acting, being subject to steam-pressure upon the opposite or flat end only. Steam is admitted successively to the six cylinders from the steam-chest (C), three pistons being constantly in action at different points of the stroke, thereby imparting a uniform rolling motion to the conical disc (E), which is supported at its centre by the ball and socket-joint (D), and also rolls upon the conical surface of the back-plate (E), which is turned to the same angle, and thus receives the full thrust of the piston, and protects the ball and socket-joint (D) from any undue strain. The crank-pin (F) is securely fixed in the centre of the conical disc (B), the rolling motion of the disc causing the pin to describe a circle, and by means of the crank (G) imparting a rotary motion to the shaft (H). The shaft (H) passes through the centre of the steam-chest (C), and carries an eccentric (I) giving motion to the circular valve (K), the action of which is more clearly shown in Fig. 3. In this figure the ports are seen in a circle, being mere openings in the thin plate of metal forming the cylinders. The valve (K) is made in the form of a split ring, the opposite flanges of which are forced assunder by the pressure of the steam entering between them, the valve consequently forms a perfect balance equilibrium valve. The steam is admitted by the inlet passage (L), and fills the annular space left in the steam-chest outside the circumference of the valve ring (K), the eccentric motion of which alternately opens and closes all the steam ports successively, admitting steam to the cylinders, from which it again escapes. As the exhaust chamber (M) formed by the inside of the valve ring, and thence through openings into the body of the engine, and is finally discharged by the exhaust-pipe (N).

All the working parts are lubricated by the steam, which is charged with oil from a lubricator on the steam-pipe. The engine is usually constructed to cut off steam at half strokes, but if desired the cut off can be altered to any point from one-tenth to a full stroke.

Messrs. Plambeck and Darkin remark that there is no doubt whatever that an engine taking up little room and working at high speed is a want long felt, and as a matter of fact several types of such engines have been put into the market during the last few years, and have met with more or less success, although some had certain disadvantages, principally arising from excessive friction and extravagance in the consumption of fuel; they claim, however, that while West's patent engine possesses all the advantages of occupying a very small space, producing a high velocity at a low piston speed, and requiring no fly-wheel, it works also very economically, has very little frictional resistance, and consequently small wear and tear, and it is capable of producing a useful effect of upwards of 90 per cent., which is unprecedented. It has no steam passages, and consequently no loss therefrom, and everything works so smoothly, and what little friction there is is distributed over such a large area that the working parts after 18 months daily working are said to have shown no perceptible wear and tear. Being light and portable, requiring no skilled attendance, and being self-enclosed, it is considered to be well adapted for outdoor work, and especially for mining districts. It is also well adapted for driving centrifugal pumps, &c., no dust or dirt can enter it, while at the same time all the working parts are so readily accessible that the engine can be entirely taken to pieces and put together again in the course of a few minutes. Owing to its high speed it is also very suitable for driving fans and all kinds of centrifugal machinery for working hoists, winches, steering apparatus, ventilators, and all applications where high speed combined with small space and economy are desirable. For general purposes it has been found to be convenient and effective in many mills and places, and it is thought that owing to the small space the engine occupies it will be an advantage to have several of these engines in different places instead of one large engine, as each of them could work independent of the other. For marine purposes the engine is fitted with reversing gear, which can be actuated while running at full speed. Being small and light, and running at great speed, it is suitable for launches, yachts, tugboats, &c. It can be put very close to the screw, and the screw may be of a very fine pitch, thus reducing slip to a minimum. The ordinary construction is that of a high-pressure expansive engine, but it can be supplied with condensing apparatus and variable expansion-gear, and be constructed as a compound engine if desired.

SMITHFIELD CLUB SHOW.—A well-finished Patent Traction Engine was exhibited by Messrs. Clayton and Shuttleworth, of Lincoln; it is of 8-horse power, and has all their latest improvements. The fore axle is made of one solid piece of wrought-iron, connected to the smoke box by a ball and socket joint. Their new patent steerage is simple and effective; dispensing with chains, the worm gears directly into a curved toothed wrought-iron rack jointed to the fore-axle. The speed of travelling can be instantaneously changed from slow to fast, or *vice versa*, by means of levers placed near to the reversing and stop valve handles, and the steerage wheel is also in the most convenient position, so that one man can both drive and steer whenever occasion requires it. The bearings of the crank shaft and intermediate motion are mounted on the patent flexible wrought-iron brackets, and stayed to the cylinder by iron rods. The main driving wheels are fitted with differential gear to facilitate turning corners, and a spring seat is provided for the steerman. A steam water-lift for filling the tank from ponds on the roadside can be employed when necessary. They also show one of their portable steam-engine, fitted with their patent self-acting expansion gear, whereby the governor controls the amount of steam admitted to the cylinder at each stroke of the piston according to the resistance to be overcome. This is the most economical arrangement that can be combined with the simplicity which is indispensable in an agricultural engine. The patent disc axle, wrought-iron wheels, patent wrought-iron crank shaft brackets, improved water heater, and other improvements are combined in this engine. They also exhibited one of their fixed engines, a finishing thrashing machine, and a stacking machine; and it is scarcely necessary to state that the whole of them appeared to be of first-rate material, and were certainly of high finish.

HORIZONTAL "EXPRESS" ENGINES.—The exhibits of the General Engine and Boiler Company at the Smithfield Club Show comprised two admirable little specimens of their patent "Express" Engines which have already been mentioned in the Journal as being calculated to work with less coal than the rough and heavy engines ordinarily employed for small powers. It is understood that the company entered for this show a 10-in. horizontal engine with patent automatic expansion gear, and three "Express" engines of 10 in., 5½ in., and 4½ in. diameter of cylinder, but the space allotted being smaller than that applied for, they were able to exhibit the two smaller "Express" engines only. These engines are got up precisely as sold, complete with two fly-wheels, governor, feed pump, stop-valve, and driving pulley, and are excellent specimens of workmanship. The "Express" engines are claimed to be much superior to the ordinary class of horizontal engines, carefully designed, thoroughly well made, and to work with about half the usual consumption of fuel. The engine is perfectly balanced by the employment of two counterweighted fly-wheels; the valve is an equilibrium slide valve; the framing is arranged to withstand the thrust and pull of the piston in the direct line of strain, and the engine is self-contained, requiring no independent pedestal, and but very slight foundation. The working parts are few in number and simple in form. The bearing surfaces are of ample area, carefully fitted, and provided with efficient means of lubrication. The finish and materials are of the best description; all the principal parts are got up bright, and the cylinder is neatly cased to prevent loss of heat by radiation.

I. X. L.—All the machinery now being erected just below our town has been received from the Vulcan Ironworks, San Francisco; its entire weight was 240,000 lbs. This mill is rapidly approaching completion. The building is mostly enclosed, the boilers have been set, and the engine will be put up next week. The pans, separators, &c., are being placed in position, and the entire work is being pushed by Mr. Arnot, the contractor, who desires to take every advantage of the present fine weather. Mr. Arnot's intention is to have the mill in working order by New Year's Day.—Rain: On Thursday morning we had a heavy fall of rain between seven o'clock and noon. Since then the weather has been beautiful, with every indication of it continuing so.—*Alpine Chronicle.*

FOREIGN MINES.

ST. JOHN DEL REY.—Telegram from Morro Velho, dated Rio de Janeiro, Dec. 12: Produce, thirty days, month of November, 38,000 oits.=14,725*l.*; yield, 7·1 oits per ton.

DON PEDRO.—Capt. Vivian (Nov. 4) reports the October produce at 3518 oits.; it would have been larger with more force available, as there is plenty of stoping ground. It is supposed to be a new lode met with in Alice's West, one not before seen in the company's property, and will be proved as soon as sufficiently laid open for dialling. No. 2 stope, on No. 8 shoot, continues to yield good quality ore. The mine captain's letter of Oct. 31 gives the details of the various points of operation. They are happy to state that the wet season is again set in, and hope to keep the water in fork if their present machinery will hold together. The incline shaft is continued very satisfactorily; only two sets of timber more required to put it down to the back of the 35 fm. plat. Capt. Vivian (Nov. 10) regrets that the best point they had at Alice's West is somewhat disturbed. The lode will no doubt be found to take its regular course after some little time. Referring to drainage, he states that the opening of the incline shaft and securing same will be completed next week, after which effort will be made to deepen the sump. All other works are progressing favourably, as well as their force will admit of, which, he is sorry to say, is but small. The mine captain's report of same date states: The water lifted from mine is 25·07 cubic feet per minute. Preparations are making to fix another wire rope in Alice's level to work with the present wire rope now running, so that they may then try to sink. Prospective and running work is being continued as usual.

— Telegram, dated Rio, Dec. 10: Produce for the month of November, 6000 oits. Sinking resumed; pumps working well.

I.X.L. (Gold and Silver).—Lewis Chalmers, No. 20: The lowest offer for sinking the engine-shaft 200 ft. further being £33 7*s* 5*d* I shall sink it by the day, and have sent for six miners to do it. The north drift is now in 314 ft. from the engine-shaft. We have a large lode in the face and some good ore. The mill is progressing rapidly.

EXCHEQUER (Gold and Silver).—L. Chalmers, Nov. 20: All the stopes are looking well. There have been 68 car loads of ore sent on top during the week. The engine bell and ore house are progressing, but not so fast as I would like. Magnificent ruby in both the 300 and 400 ft. drifts. The main building at the mill is being shingled to-day, and when finished up goes the battery. Dare not erect the battery till protected from rain and snow. The weather could not be finer than it is to-day. To give you an idea of the size of the mill the main building over the new and old batteries require 40,000 shingles; these we make ourselves.

CEDAR CREEK.—The directors have received advices from their superintendent (Col. T. B. Ludlum), Nov. 20, as follows:—Since my last I have been very closely occupied crowding forward the work of fitting up the Baker section of the Yankee tunnel, and now have the pleasure of informing you that the same is completed. We ran the water through the Baker shaft for a short time on Saturday the 18th, and for a few hours to-day. Everything works well, and with care I anticipate but little trouble. We shall, however, be obliged to be very careful, and cannot expect to run water for but a few hours each day until we have cleared an opening. I have heretofore informed you that all the gravel below our shaft (on the ancient channel) had been drifted, and that all above that point was solid. We can make but slow progress until we have worked off the drifted ground between us and the shaft, and have obtained a face of solid gravel which we can blast up. I think it will take about a month's washing to accomplish that object, after which we shall have clear sailing.—Star and Union: I heretofore informed you that this claim is rigged for washing through the Yankee shaft. The Giant is set, the new Derrick is in position, and everything is in readiness for the approaching season. The Central claim is still washing when we have water to spare; unless we are soon favoured with more rain, however, I shall be obliged to shut it down, as the water running in our ditch is very low. Our ditches are cleaned out, our flumes nearly all repaired, and we will soon be ready for the season to commence in earnest.—The Elmore Hill Claim: One of our water customers has started up and using water a few hours each day. The prospect is very encouraging.

BLUE TENT.—The directors have received advices from their superintendent (D. T. Hughes), Nov. 20, as follows:—This week we cleaned up only a portion of the Enterprise flumes and undercurrents, and hereafter we intend to clean up at this claim only in sections when favourable chances permit any day or a portion of a day when we cannot use water on the bank, and will make it a point to clean up a section or two as time will allow, as it takes too long to clean the whole at one time, and deprives us from using water on the bank for too long a time, and compelled us to waste water at times when we have much water to take care of for the lack of reservoir capacity. We intend cleaning up South Yuba the fore part of next week. The powder drift is progressing favourably. The straight drift is in 80 ft., and one of the angles 20 ft.; we do not intend to set this blast off until we make another clean up after this of next week; both claims are now in a favourable condition, and shall endeavour to watch every opportunity and make every point till then, so as to bring the yield up as high as possible. We still have some free water, as you will see per statement.

PESTARENA UNITED.—Dec. 7: District Val Toppa, Zero Level: In the end, south of first cross-cut westward on the western part of the quartz lode, we have an improvement; lode producing at present 1½ ton of ore per fathom, worth per small mill trial 1 oz. 18 dwts. 17 grs. of sponge gold per ton, and by assay 1 oz. 14 dwts. 18¾ grs. of fine gold, and 9 dwts. 7½ grs. of fine silver per ton. We take this ore to be the commencement of the shoot of ore so long look forth to in this end, and we have no doubt but that a good run of ore ground will be opened up on this lode southward. The lode in the end south, in the intermediate level below Zero, has improved, now yielding 10 tons of about 8 dwt. ore per fathom. The stopes in bottom, behind this end, yield 12 tons per fathom, worth 12 dwts. per ton.—No. 1 Level: The stope in back on this lode, north of winze, yields 7 tons of ore per fathom, worth 9 dwts. of gold per ton.—No. 2 Level: The stope in back, south of first cross-cut west, yields 9 tons per fathom, worth 8 dwts. of gold per ton.—Great Quartz Lode: In the new drive in north end of ground, 20 metres above No. 2 level, the lode produces about 5 tons of low class ore per fathom. Stope in bottom of No. 2 level on this lode, north of winze, is yielding 12 tons of about 7 dwt. ore per fathom. In the new drive in No. 2 level, south of first cross cut on the eastern part of the great quartz lode, we have communicated to the old workings, opening up some stoping ground of low grade. In the No. 3 level south in the mountain we have ceased driving for the present, the men being required for stoping.—Marino Rosso Lode: On this we have commenced driving south of first cross-cut on discoveries; lode about 14 inches wide to commence with.—Flat and New Lode: The stope in bottom of No. 1 level has failed somewhat, and we have suspended it until a more favourable time for picking the stuff. At No. 2 level the drive in north end of stope, south of fourth cross-cut on the flat lode, yields about 9 tons of 8 dwt. ore per fathom. The stopes south of this drive continue to yield 12 tons of about 10 dwt. ore per fathom. The stope in the eastern side of an intermediate drive under No. 2 level, north of winze on the turn of tide flat lode, we estimate to yield at present 10 tons of 8 dwt. ore per fathom.—Lode and Branches East of New Lode: The stope in back of No. 2 level, south of fourth cross-cut, is not looking so well, yielding now about 5 tons per fathom, worth 8 dwts. per ton. In the rise on branch of new lode, south of first cross-cut east, the lode is producing 8 tons of 8 dwt. ore per fathom. The first cross-cut west in No. 3 level is suspended, as the men are wanted for stoping.—No. 4 Level: In the end, north of second cross-cut east on the new lode, the lode is 3 ft. wide, mostly quartz.

District of Pestarena: The incline shaft was sunk below the 90 during the past month 3 metres; the lode yields about 8 tons of ore per fathom, worth as per small mill trial 15 dwts. of gold per ton. The 90 end north yields 2 tons, worth 17 dwts. of gold per ton. The 90 south yields 4 tons per fathom, worth as per mill trial 1 oz. 6 dwts. per ton. In the 80 north the lode is small. In the 65 cross-cut west we have traversed in the past month a lode or branch, worth about 1 ton of ore per fathom, giving 1 oz. 5 dwts. per ton. Nothing of any value has yet been met with in the 55 cross-cut east. The stope in back of the 55 yields about 1½ ton per fathom—suspended. The 33 north yields 2 tons per fathom, worth 11 dwts. per ton. No. 2 stope, in the back of this level, is yielding about 3 tons per fathom, worth per mill trial 1 oz. 4 dwts. per ton.—Acquavite Department: The new stope in back of the 55 is estimated to yield 9 tons of ore per fathom, worth per mill trial 1 oz. 6 dwts. per ton. In the 46 south the lode is yielding about 2 tons per fathom, worth 14 dwts. of gold per ton. The stope in the back is suspended. Most of the stopes suspended will be resumed at a more favourable time for amalgamation. The construction of the new adit is still being pushed forward, and fair progress is being made. We have for the past few days been doing some repairs to the old Acquavite adit, and find further repairs necessary. All machinery is working satisfactorily, both at Val Toppa and at Pestarena district.

CAPE COPPER.—Capt. Tonkin, Oct. 31: Ookiep: We have commenced to sink the shaft below the 80, and we hope to push it down to the 95 at a rapid rate. When the shaft reaches the required depth for the level I intend to push out a driving eastward, and in the course of a short time we shall start a winze below the 80 in order to facilitate the opening out of the deep workings, and give good ventilation throughout the bottom of the mine. The 80 east has greatly improved during the month, and the present end of the driving is worth 10 tons of rich copper ore per fathom. The stopes in the bottom level are also yielding well, especially the one east from No. 19 winze. We are at present working vigorously in this part of the mine; in fact, one-fourth part of the stuff drawn from underground is taken out of the 80 stopes. The 80, north-east from shaft, continues to yield 1½ ton of yellow copper ore per fathom, and just now we are preparing to sink a winze below the 68 in order to communicate with this point. No. 21 winze below the 68 has fallen off a little in value, but the ground is still moderately productive, worth 4 tons of ore per fathom. The 68 east produces a little copper ore, but not enough to value. The 68 south falled during the past month, while the driving south-east from No. 15 winze improved considerably. The stopes in the 68 are yielding moderately well, and the same remark holds good in reference to our workings in the upper levels.

Spectakel.—Capts. Tonkin and Ninnis, Oct. 25: There is nothing to report from this mine, but we may notice that the trial works indicated in former reports are now being carried out, and in the meantime we are returning all the ore we can to meet the cost of explorations. The water supply for dressing purposes is again falling, and unless we shortly get rain our surface operations will be carried out under great difficulties.

Trial Mines.—Capts. Tonkin and Lanksbury, Oct. 15: At Karolusberg the 20 east is very poor; the forebreast of the driving shows some green stains of copper, but at present the ground in this direction does not look very promising. We have started to drive a 20 fathom level west from shaft, and in the present end of the driving there is a little ore, and the ground has a very kindly appearance. The 10 fathom level east continues to produce small quantities of copper pyrites, but we are not opening out any ground that can be stoped away at a profit. At Nababeep the 17 drivings have not undergone any change worth noticing, but the stope continues to yield a fair quantity of copper ore. Altogether this mine looks promising, and its trial in depth will be an interesting operation. We have suspended the working of Kilduncan Mine as the trials there are thoroughly exhausted. The 20 at Narrap shows copper pyrites, magnetic pyrites, and lead ore, but it does not yield anything to value.

Returns for October: Yield from Ookiep, 900 tons of 20 per cent. From Spectakel, 33 tons of 25 per cent.—Bills of lading received: 300 tons per Mabel.—Arrival at Port Nolloth: The Antonio Vinent, to load about 650 tons.—Arrivals at Swansea: The Corsair and Elta.—Sales by public ticketing: 215 tons of ore on Nov. 21 at an average of 15*s.* 10½*d.* per unit, realising approximately 545*l.*; and 790 tons on Dec. 5 at an average of 15*s.* per unit, realising approximately 15,900*l.* Dividend declared 20*s.* per share, payable on the 23rd instant.

[For remainder of Foreign Mines see to-day's Journal.]

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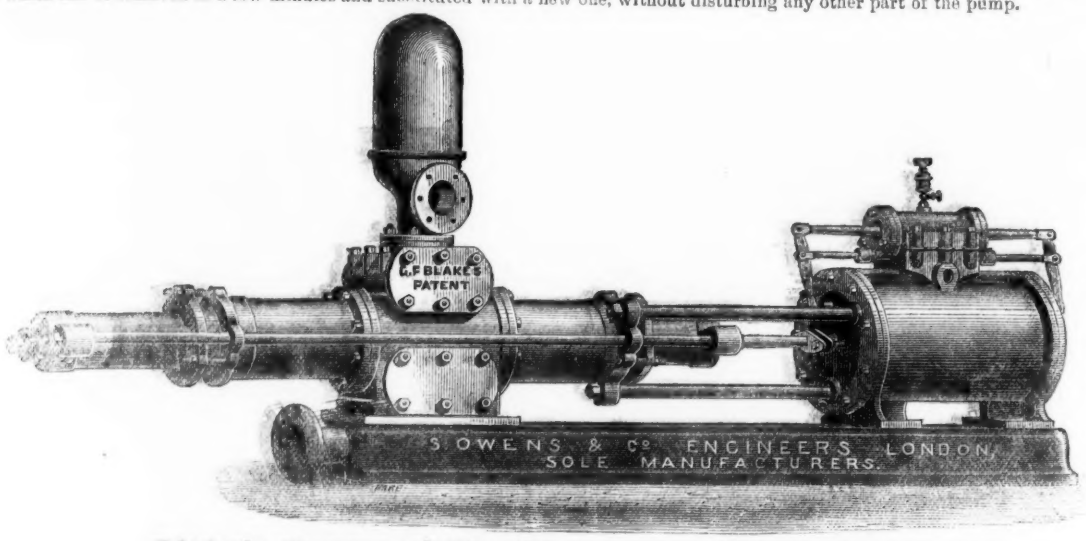

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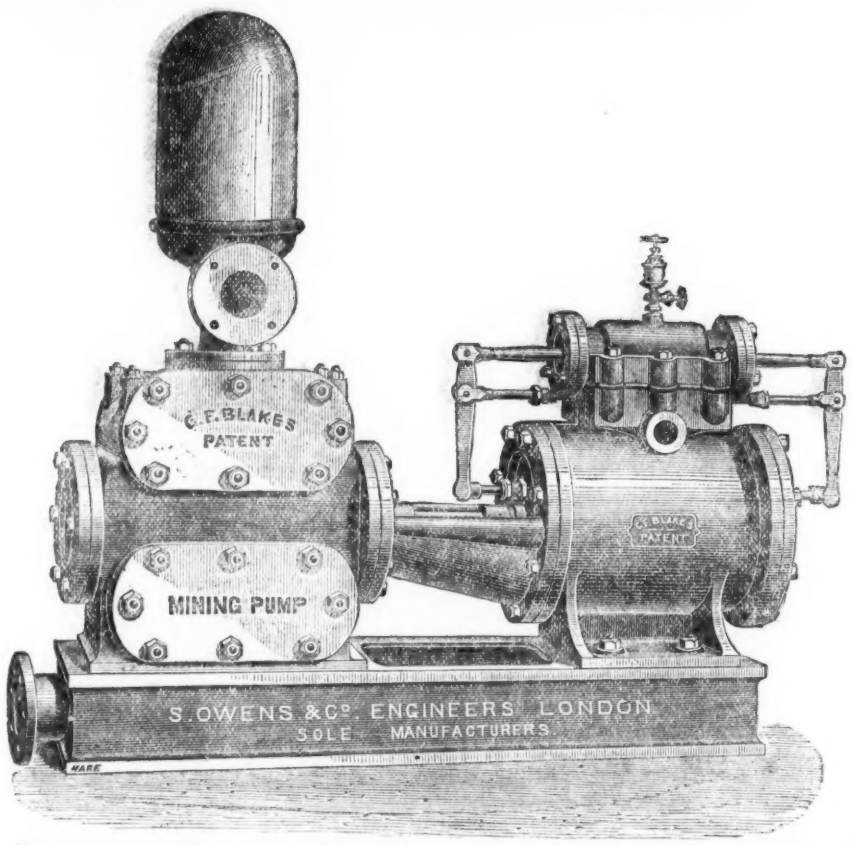

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Dia. of steam cylinders.. In.	12	12	12	12	14	14	14	16	16	16	16	18	18	18	18	20	20	20	20	24	24
Dia. of water cylinders.. In.	3	4	5	6	4	5	6	4	5	6	8	4	5	6	8	5	7	8	9	6	8
Length of stroke ..... In.	18	18	18	24	24	24	24	24	24	24	24	24	30	30	30	30	30	36	36	36	42
No. of strokes per minute..	30	30	30	30	25	25	25	22	22	22	22	22	22	22	22	20	20	17	17	17	15
Quantity in gallons per hour, approxmately ...	1440	2610	4200	5940	2940	4620	6600	2646	4158	5940	10620	2646	5160	7500	13260	4586	9000	12360	15660	8720	12000

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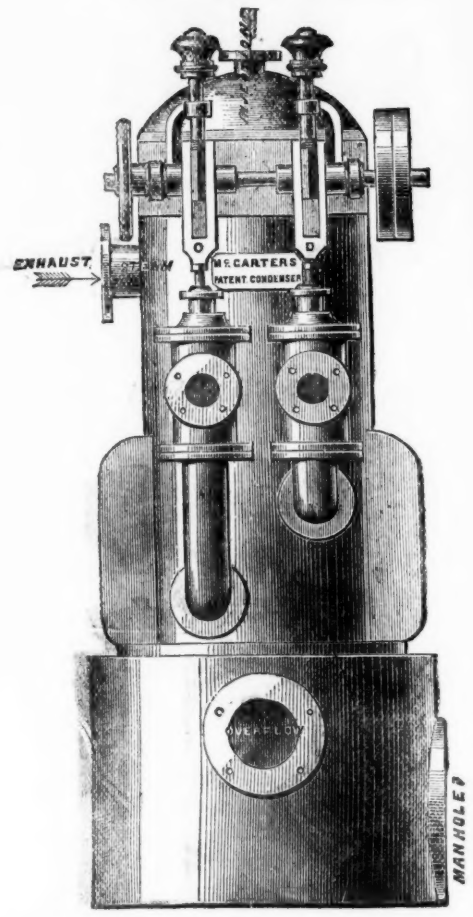

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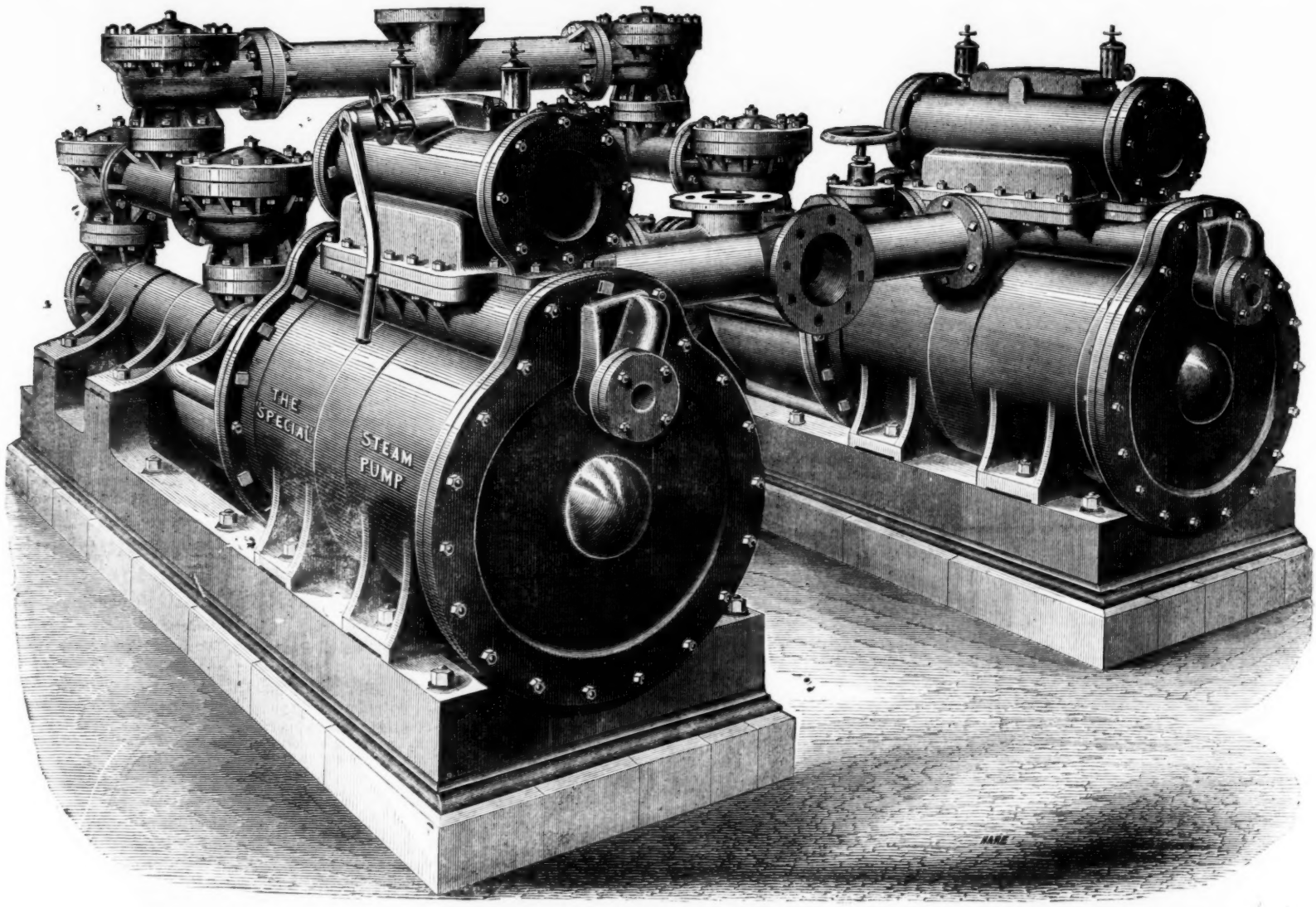


PAIR OF THE "SPECIAL" DIRECT-ACTING STEAM PUMPS SUITABLE FOR HIGH LIFTS IN MINES, SIMILAR TO MANY SUPPLIED BY TANGYE BROTHERS AND HOLMAN.

The following extracts from a letter, received by Tangye Brothers and Holman, from J. Bigland, Esq., dated Feb. 25, 1875, refers to a "Special" Direct-acting Steam Pumping Engine supplied four years ago to Messrs. Joseph Pease and Partners, for the Adelaide Colliery, Bishop Auckland. The engine is throwing about 8000 gallons per hour, 1040 feet high, in one direct lift:—

"The underground pumping engine at Adelaide Colliery is working night and day. It does its work satisfactorily, and gives us very little trouble. Some of the cup leathers which form the plunger packing have worked three months. The working barrel is in beautiful condition. The average duration of the valve seats is about eight months; they work and keep tight as long as there is a bit of them left. I expect the valves (Holman's patent) and the buffers will last as long as the colliery."

Extract from a letter received by Tangye Brothers and Holman from W. H. Eagland, Esq., dated Feb. 27, 1875, in reference to a "Special" Direct-acting Steam Pumping Engine supplied two years ago to the West Yorkshire Iron and Coal Company near Leeds, to throw 16,000 gallons per hour, 465 feet high in one direct lift:—

"It is at work night and day. Our man goes down to the pump twice a day (Ten A.M. and Four P.M.), to supply the tallow cups. After this it is left every day till he comes next morning, when he goes down again at Ten A.M. as before. The only repairs the pump has had for 12 months are one bucket, which had worked since we got the pump, and one valve seat, but no valve, so it has cost very little. Its first lift is 70 yards perpendicular, then the water passes up pipes for half a mile, ascending another 70 yards, and then another perpendicular pipe of 15 yards—total, 55 yards vertical height.."

Extract from the Official Report of the Commission of the German Empire on the Vienna Exhibition of the 1873, treating on Pumping Engines:—

"Contrary to these older pumping engines exhibited, there is now nearly everywhere the opinion established that the ('SPECIAL') pumping engines placed underground, which are made on A. S. Cameron's principle by Messrs. Tangye, are preferable to all. They do much duty combined with great compactness. They dispense entirely with the troublesome rod arrangement, giving often rise to stoppages, so that they will be applied shortly to a great extent, and are already in use in many localities. There is no doubt that this is in every respect practical system will command a general adaptation."

200 SIZES AND COMBINATIONS OF THESE PUMPS ARE NOW MADE.

The following are a few of the Sizes for High Lifts in Mines:—

Diameter of Steam Cylinder .....In.	7	8	9	9	10	10	12	12	12	14	14	14	16	16	16	16	18	18	18	18	21	21	24
Ditto of Water Cylinder .....In.	3	3	3	4	3	4	3	4	5	4	5	6	4	5	6	7	5	6	7	8	5	6	7
Length of stroke.....In.	24	24	24	24	36	24	36	36	36	36	36	36	36	36	36	36	48	36	36	36	48	48	36
Gallons per hour approximate	1830	1830	1830	3250	1830	3250	1830	3250	5070	3250	5070	7330	3250	5070	7330	9750	5070	7330	9750	13,000	5070	7330	9750
Height in feet to which water can be raised with 40 lbs. pressure per sq. in. of steam or compressed air at pump	325	425	540	300	665	375	960	540	345	735	470	330	960	615	426	312	775	540	400	300	1058	740	540

CONTINUED.

Diameter of Steam Cylinder .....In.	21	21	21	24	24	24	24	24	26	26	26	26	26	30	30	30	30	30	32	32	32	32	36
Ditto of Water Cylinder .....In.	8	9	10	6	7	8	9	10	7	8	9	10	12	8	9	10	12	14	8	9	10	12	14
Length of stroke.....In.	36	36	36	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
Gallons per hour approximate	13,000	16,519	20,000	7330	9750	13,000	16,519	20,000	9750	13,000	16,519	20,000	30,000	13,000	16,519	20,000	30,000	40,000	13,000	16,519	20,000	30,000	40,000
Height in feet to which water can be raised with 40 lbs. pressure per sq. in. of steam or compressed air at pump	413	326	264	900	700	540	427	345	827	633	500	405	282	840	665	540	375	275	960	758	625	456	315

PRICES OF THE ABOVE ON APPLICATION.—FOR SIZES AND PRICES OF PUMPS FOR LOWER LIFTS SEE SEPARATE LIST.

HOLMAN'S PATENT CONDENSER will be found a great acquisition to all kinds of Steam Pumps, as not only is the exhaust steam completely condensed, and the annoyance from same blowing off entirely got rid of, but a vacuum is obtained in the steam cylinder saving from 20 to 50 per cent. in fuel, and increasing to a considerable extent the economy and efficiency of the Pu[illegible].

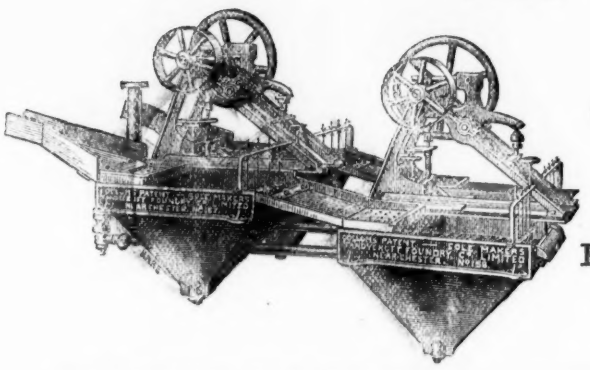
NORTH OF ENGLAND HOUSE ... ... TANGYE BROTHERS AND RAKE, ST. NICHOLAS BUILDINGS, NEWCASTLE-ON-TYNE.
SOUTH WALES HOUSE... ... ... TANGYE BROTHERS AND STEEL, Tredegar Place, NEWPORT, Mon.; and Oxford Buildings, SWANSEA.

PATENT IMPROVED ORE WASHING & DRESSING MACHINES.

THE SANDYCROFT FOUNDRY & ENGINE WORKS CO. (LIMITED), NEAR CHESTER

LATE THE MOLD FOUNDRY CO. (ESTABLISHED 1838).

SOLE MAKERS IN GREAT BRITAIN.



HUNDREDS IN USE.

FULL PARTICULARS,
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UPON APPLICATION.

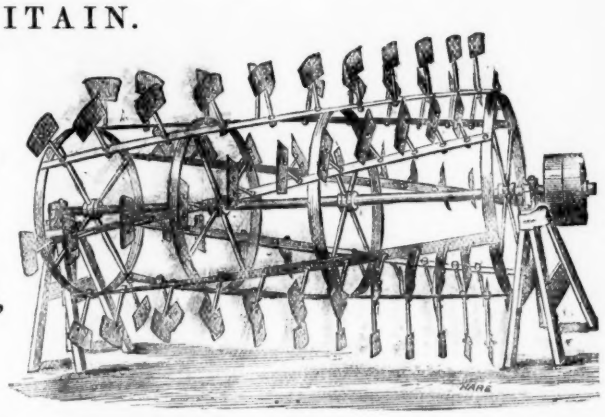
Will supply Designs, and all the necessary Plant for laying out Dressing Floors; also

MANUFACTURERS OF EVERY VARIETY OF

MINING MACHINERY,

PUMPING & WINDING ENGINES,

PITWORK, CRUSHING MILLS,
ROLLS
OF PECULIARLY HARD AND TOUGH MIXTURE
&c., &c.



COLLOM'S PATENT AUTOMATIC ORE WASHING MACHINE, working at the following and many other Lead, Copper, Blende, and Tin Mines:—Great Laxey, Cape Copper, Pontgibaud, Linares, Alamillos, West Tolgus, Lisburne, Minera Halvans, Snailbeach, &c.; and also at Messrs. Vivian and Sons' Works, Swansea.

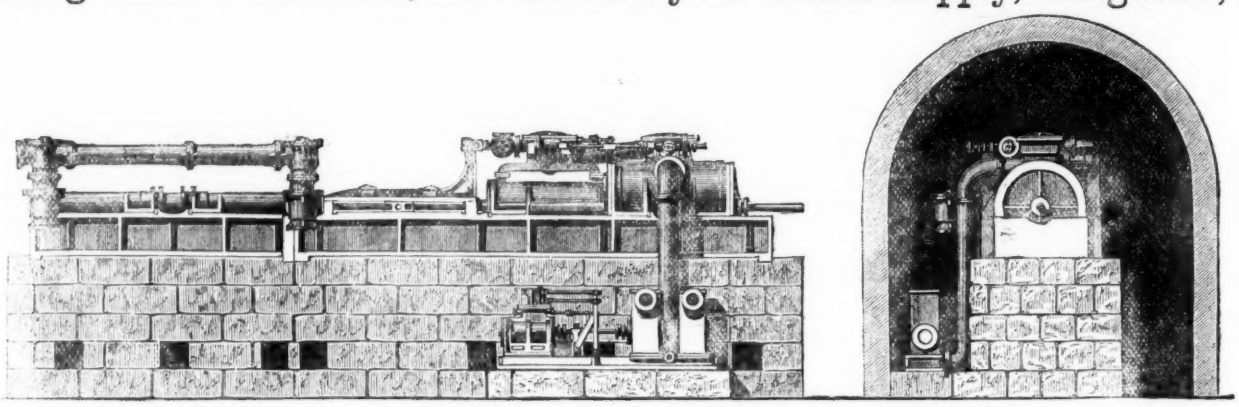
PATENT IMPELLER, OR KNIFE BUDDLE, in use at the following and many other Lead, Copper, Blende, and Tin Mines:—The Van, Roman Gravels, Tankerville, Ladywell, Lisburne, East Black Craig, Old Treburgett, Penhale & Barton, Bog, Linares, Fortuna, Alamillos, Minera Halvans, &c.

LONDON OFFICE: 6, QUEEN STREET PLACE, E.C.

HATHORN, DAVIS, CAMPBELL, AND DAVEY,

MAKERS OF

The Differential Pumping Engine, Hydraulic Pumping Engines, Cornish Engines, Differential Blowing Engines, Compound Rotative Engines, the Separate Condenser, Hydraulic Machinery, Mining Plant of all kinds, and Machinery for Water Supply, Irrigation, &c.



THE COMPOUND DIFFERENTIAL ENGINE AND FORCE PUMPS,

With Separate Condenser, as applied Underground, forcing 700 gallons per minute 920 feet high.

SUN FOUNDRY, LEEDS.

FURTHER PARTICULARS ON APPLICATION

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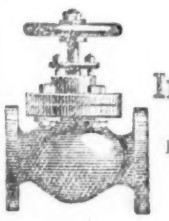
For WATER SUPPLY to TOWNS, LAND IRRIGATION, and MINERAL EXPLORATIONS, may be executed of any diameter, from 6 in. to 36 in., and to any depth to 2000 ft.,

Pistons & Air-pump Buckets fitted with Patent Elastic Metallic Packing

of which upwards of 8684 have been made to March, 1875.



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MAKERS OF LARGE PUMPS AND PUMPING ENGINES.

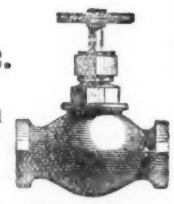
Improved Valves and Taps for Water, Steam, Gas, &c.

PATENT STEAM EARTH-BORING MACHINE

ENGINEERS and MACHINE MAKERS to CALICO PRINTERS, BLEACHERS, DYERS, and FINISHERS.

SALFORD IRONWORKS, MANCHESTER.

PRICES AND PARTICULARS ON APPLICATION.



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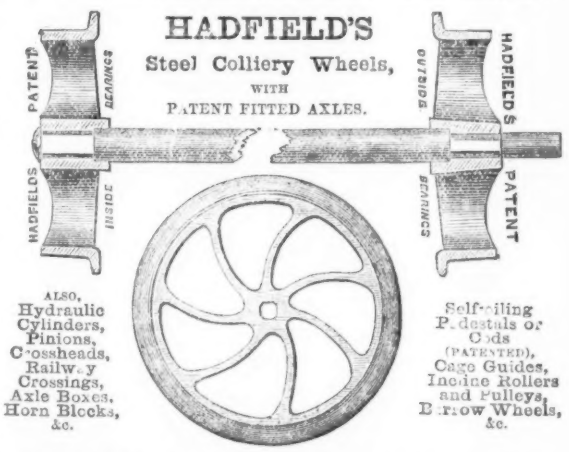
Steel Colliery Wheels,

WITH

PATENT FITTED AXLES.



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ATTERCLIFFE, SHEFFIELD.

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